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Johnstons' Dental Miscellany,

A MONTHLY JOURNAL OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
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JOHNSTON'S

DENTAL MISCELLANY,

FOR 1875.

It is certainly reasonable cause of self-congratulation on the part of the publishers of this Journal, that the end of the first year of its publication finds it with a large and constantly increasing list of subscribers, and that they are constantly in receipt of letters of encouragement and commendation from their readers in every section of the country, and even from distant portions of the world, one such letter being recently received from Japan.

We are promised one or more articles from each of the following gentlemen of established reputation, and others of like standing in the profession have encouraged the expectation of like favors from them.

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Dr. T. H. CHANDLER, Boston.

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PERSONAL INDEX.

As it is often important to each participant in public proceedings to recall what he did or said, we think that an index of the names mentioned in our pages during the past year will be a convenience to many. Where a name occurs more than once in the same article, only the page of its first occurrence is designated. Capitals are used with the names of authors whose writings have appeared in our pages for 1876.—ED.

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JOHNSTONS

Dental Miscellany.

VOL. III.—*JANUARY*, 1876.—No. 25.

A CASE IN PROSTHETIC DENTISTRY.

By N. W. KINGSLEY.

A Scotch gentleman under thirty years of age, while on a gunning expedition in the Southern States, met with a serious wound of the face from the accidental discharge of his gun.

Carrying the gun at his side in the woods, the trigger was undoubtedly caught by a twig, and the explosion which followed carried the contents, which consisted of shot, through the right side of the face.

The charge first struck the anterior part of the chin near the symphysis, carrying away a V-shaped section of the lower jaw and alveolar process with several teeth. The further course was to the right of the nose, past the outer corner of the eye, and passing off on the temporal surface of the frontal bone. In its track it tore away entirely the right superior maxilla, all the incisor teeth, the vomer, palatine and malar bones, together with portions of the temporal, ethmoid, lachrymal and turbinated bones.

A reference to Fig. 1 will show the general character of the destruction of the soft tissues, including the right eye.

The patient was of sound constitution and otherwise in good health, and was sufficiently recovered to come North within a few weeks after the accident, when he presented himself to me for treatment. I found the wound healed; considerable tissue had formed and filled up the vacancy made by the absence of the malar bone. The remaining portions of the inferior maxilla had approximated and united, and in doing so had destroyed the articulation with the upper teeth on the left side,

and also with the upper jaw at the joint, thus throwing the chin nearly an inch to the right, and out of line. The hard palate being entirely gone, and no lips to close the oral opening, articulate speech was impossible; communication could only be made by him in writing. The patient was sustained solely with fluid nourishment.

The first step was to restore the normal articulation of the lower jaw. I recommended the patient to place himself under the surgical care of the late Prof. Krackowizer, whose skill in plastic surgery was unexcelled.

I made a splint to keep the lower jaw in its proper position when replaced, and together Prof. K. and myself broke up the false union and carried the fragments into place, where they were retained by the splint without bandaging or other apparatus. This restored also the chin to its proper relation with the other features.

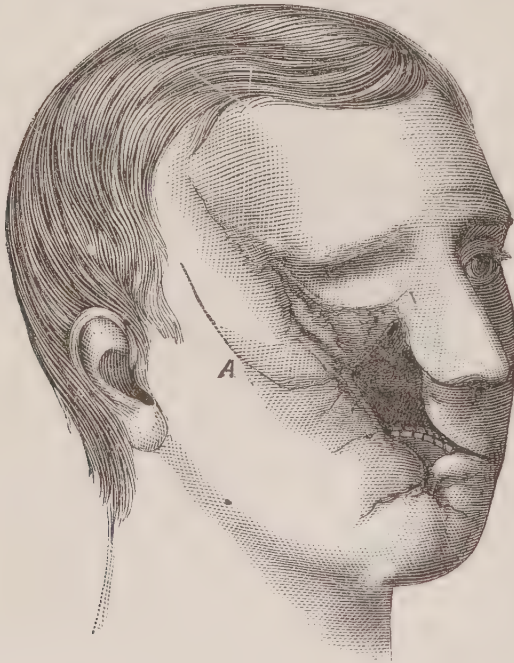


FIG. 1.

In the meantime Prof. K. determined upon a series of operations for closing the opening in the cheek; the first of which was to attempt to form a lower eye-lid.

The details of the surgical steps, it is not the province of this article to describe.

The operation for the renewal of an eye-lid was a success, the flap being obtained by an incision along the dotted line in Fig. 1, marked A, and bringing the end, marked 1, up to the side of the nose at 1, and making the attachment.

It healed readily, the union was good, and in a few days a very respectable lower eye-lid was the result. It was at this stage that I made the model from which the drawing, as shown in Fig. 2, was taken.

In this plaster cast I have a perfect representation of the buccal and nasal cavities in all their intricacies; including lower jaw, tongue, fauces, soft palate, turbinated bones, and nasal passages to the nostrils.

The impression was made entirely of plaster, and taken in sections as follows:

Plaster was first carried into all the intricacies of the nasal passages, thus making a roof to the mouth of plaster, the patient meanwhile

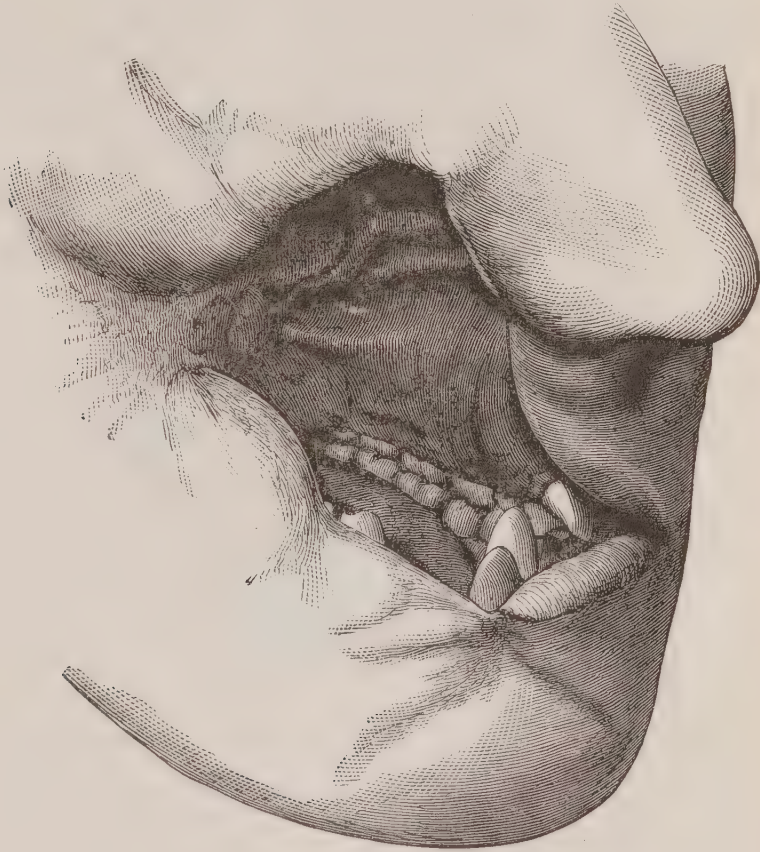


FIG. 2.

breathing below the palate and through the mouth. When this was set it was removed, and the portions which followed the recesses were broken off the impression, (to be subsequently restored), and the impression replaced.

The removal of these portions permitted the patient to breathe then, above the palate and through the nose. Plaster was then applied to all

the remaining portions of the buccal cavity and the external adjacent parts, and resulted in a model as shown in Fig. 2.

The next operation for the patient's benefit was a mechanical one of no ordinary difficulty.

An observation of Fig. 2, together with a little reflection, will show that it was desirable to form a new roof to the mouth, a new jaw on the right side, and a new cheek-bone, if possible, to restore contour to the cheek.

Such an apparatus must necessarily be bulky and more or less weighty, and, worse than all, there was no solid tissue for support. I conceived the idea, however, that if I could bridge over the roof of the mouth with something that would abut firmly against and on top of the jaw on the left side, and extend my appliance upward and outward into the locality of the missing cheek-bone, the flap which must ultimately close the cheek would come *under* this artificial cheek-bone, and thus support my whole appliance on that side.

My first experiment was with vulcanite. I made a somewhat artistic model, which included a new floor to the nares, a new roof to the mouth, new jaw, teeth in front and on the right side, and a malar process.

This model was then duplicated in vulcanite, and as the bulk was great, it was made a mere shell in form, many parts being not thicker than a thin cardboard. As it was impossible to make a complete shell of one piece of vulcanite, the upper part was left open, and after the vulcanite was finished within and without, the top was closed with a piece of aluminum-plate struck into shape, accurately fitted, and cemented into its place. This instrument in a modified form is shown in Figs. 3 and 4.

The aluminum-plate is represented in Fig. 3, and marked E, E.

A represents the portion fitting under the inner corner of the eye.

B, the malar process.

D, D, the edge which laps on to the soft palate.

The weight of the whole when complete was very trifling. I have said that Figs. 3 and 4 represent that instrument in a modified form.

The modification consisted in the reduction of the malar process marked B, which in the first instrument was much larger.

In the preparation of this appliance I had cut away in my plaster model of the cavity, a portion which represented the soft tissue in the malar locality, a part of my plan being to make an incision in the natural soft tissues within the cavity, for the reception of my malar pro-

cess, and thus lift the tissues out to the desired contour. When my instrument was ready for adjustment, Prof. Krackowizer made the proposed incision and the appliance was introduced. The adaptation was excellent, and the malar process was fulfilling our expectations in lifting out the cheek.

With a patch over the cheek-opening to confine the sound, the patient immediately articulated distinctly. In a few days I made a careful examination of the case and the piece did not seem to be in such accurate

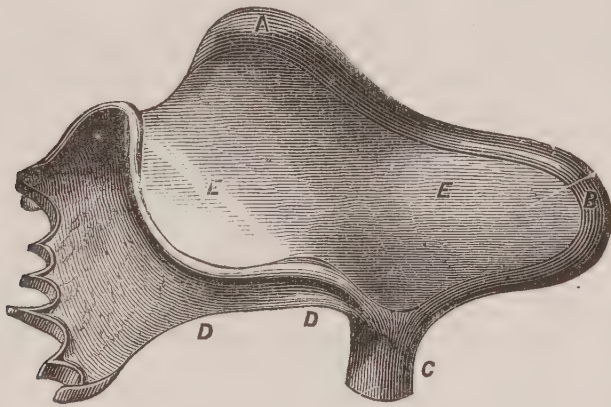


FIG. 3.

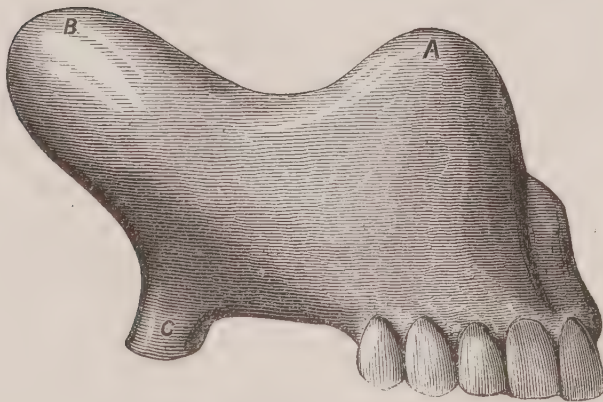


FIG. 4.

contact with the firm and healthy jaw of the left side as it had appeared on introduction. Furthermore, I observed that my artificial malar process was immediately under the scar shown by the dotted line in Fig. 1, and also plainly seen in Fig. 2.

In another few days the discrepancy of adaptation had increased, and the tissue over the malar process was becoming transparent.

Within two weeks from its deep-seated introduction, (there being nearly three-quarters of an inch in thickness of tissue over it) this malar process was on the outside of the cheek and everything healed, and as solid as before.

The explanation being that there was nothing but cicatricial tissue over it in the start, which gave way as soon as there was any pressure on it, and the appliance traveled through it without hindrance.

Nevertheless it was not without good results. The first effect was to lift out the external contour, and new tissue formed and filled up the cavity behind the appliance as fast as it moved, so that in the end there was much more fullness than there was before the experiment was made.

The instrument was then modified in shape to meet the emergency, and worn to develop any further peculiarities.

After a limited trial of wearing it with much satisfaction, I set about duplicating it in another material.

As the final surgical operation would close the cavity so that the appliance could not be removed, and therefore it must remain there during life, I was not willing to subject the patient to the uncertainties of vulcanite, besides a little prejudice I had against it on the score of cleanliness and healthfulness.

Freedom from weight being a great desideratum, I decided on Aluminum.

I shall not enter into a description of the annoying experience in my effort to conquer that material, and in the end it conquered me. I spent weeks in experimenting. I sought out everybody I knew, who had had any experience with the hateful stuff. There was no difficulty in getting the sections of my shell in exactly the form I desired, and in joining them to each other, but to solder them and make a shell which would be air-tight, even leaving one last hole for vent, I found impossible, and at last I gave up in despair and abandoned the material.

There was but one recourse, and that was gold. I used 20 karat gold, rolled down just as thin as I could work it, and succeeded in making a beautiful shell of very little weight. To this were attached the few teeth that are represented in Fig. 4. These were sufficient for appearance, and it was not desirable to provide any for masticating purposes on that side of the mouth, as masticating would create a motion which might be prejudicial to the stability of the appliance.

The gold was substantially a duplicate of the first one, as shown in Figs. 3 and 4.

The projection marked C came down to meet a molar tooth on the lower jaw, and was made tubular and left open while working the gold. In this way there was no difficulty in making the shell otherwise air-tight. Unless there is an opening of this character, it is difficult to make a perfectly air-tight shell by soldering.

I tested the shell by putting a piece of rubber tubing on this leg, and immersing the whole in water; blowing in the shell would reveal the slightest leakage by a little air-bubble on the surface. Ultimately this last opening was closed without heat.

My appliance being perfected and introduced, Prof. Krackowizer continued his surgical operations. Immediately on the introduction of the instrument, the Professor performed an operation which shut it in completely.

An incision was made across the upper lip, parallel with, and about half an inch from its border, and the whole length of the mouth.

This strip, which was free at the end on the right side, was stretched, and attached to the cheek on the right, thus making a new oral opening. At the same time, other incisions were made in the vicinity of the angle of the jaw, and the cheek worked up until it was brought into contact with the opposite side of the cavity at the base of the nose. The cavity was then completely closed. Most of this operation did well. The lip and mouth was a complete success. Some parts above gave way, requiring two or three minor operations, which were much delayed by the unstable character of the tissue, resulting from so many operations. The notched appearance in the lower lip was also subjected to an operation, with much benefit to appearance.

Immediately on his recovery, after the introduction of the gold apparatus, the patient told me that he masticated and enjoyed his food as well as he ever did, and there was certainly not a trace of defect in his articulate speech.

AMALGAM AND ARSENIC IN EUROPE.

By C. M. WRIGHT, Basel, Switzerland.

Being an "expatriated practitioner" of dentistry, and not having the blessed privileges that brothers at home have, of the stimulus of direct and personal interchange of ideas, of frequent meetings with each other, of constant sharpening of wits against each other, the writer is compelled to get his information about the questions of the day, through the excellent periodicals of America, England and Germany—and in a review of the American and English journals for a year or so past, one is struck with the number of articles, essays and discussions on the old question of Amalgam. The same men who, a dozen years

ago, openly condemned the use of the paste, the humbug succedaneum, stand to-day on exactly the other side—and while it was not only an unfashionable, but rather a bold and dare-devil position for a man to take, but two or three years ago, that he considered amalgam an excellent material for filling certain teeth, it would require nearly as much courage to-day, in the face of the investigators and their published results, to utterly condemn the use of this restored child. What the effects of the discussions, the results of the careful and patient investigations of such men as Bogue, Hitchcock, Cutler and others, will be in America, we have no present means of even guessing. We do not know over here whether our fashionable dentists at home are using more and more amalgam than formerly or not, or whether the manufacture and sale of the article has been or will be increased. In this part of Europe the sale and use of amalgam will not be increased—cannot be increased, (unless the expatriated practitioners—the American dentists abroad—should use it more), for the reason that probably the maximum quantity has been employed all along for the operation of filling teeth by the dentists of these countries.

Here, on the continent of Europe, is the best field for practical investigations of the uses and results of amalgam as a filling for decayed teeth. By “practical investigations,” I do not mean to infer that theoretical and chemical investigations are not practical, but that here a dentist can see just as much amalgam in the teeth as he might wish for any direct investigations of its appearance and results. The average native dentist buys a pound of amalgam to the eighth ounce of gold foil, surely—and molars, bicuspid, and incisors are alike filled with this beautiful cement. For many years it seems to have been the custom of dentists here to first apply arsenic to every sensitive cavity, and then, without cutting away more than the soft decay, to fill it with amalgam. Now the teeth in this neighborhood are not better in character than our poorest American specimens—chalky teeth abound, and vascular teeth abound. Arsenic works as well here as it does in America—it devitalizes the pulps as surely, and brings out a crop of abscesses about as regularly. Many an otherwise beautiful woman is disfigured by blue-black incisors and pet abscesses over three or four of them. These generally continue filling and emptying themselves at short intervals for a few years, and then, strange to say, often dry up altogether. When the amalgam is removed by an American dentist, and the pulp canal opened, a peculiar *dry, dead* odor—I don't know how else to describe it—is noticed; but it is never observed excepting in

these cases. The amalgam itself, the walls in contact with the amalgam, and the pulp canal, all seem to be permeated with this odor. These *teeth* have been preserved—in a rather bad condition to be sure, but still they have been preserved from direct caries for many years. The electric balance between the tooth and the black amalgam must have been about right to insure the resistance of further decomposition from outside influences. From the color and hardness of the amalgam, I should think it was about equal in quality to the old silver coin amalgams. Here we have teeth preserved, saved for usefulness for many years, but utterly ruined in appearance—and many mouths with a number of these fillings in the teeth are as black as children's are after eating berries. The whole tooth or teeth are thoroughly black, and yet they seem to have hardened in texture as well. The teeth we see filled by English dentists do not become quite so black, and the teeth of English people are better in quality, having generally hard, smooth enamel, and firm dentine. From observation here we can say positively that amalgam, as used by native dentists, does preserve the teeth—and does spoil them entirely in appearance. From observation of my own work with amalgam here in these soft, chalky teeth, and with Arrington's, Townsend's, Lawrence's and Fletcher's Amalgams, while I have succeeded in not affecting the color of the teeth so much—that is, in keeping the color better, I must place Amalgam low down in the scale as a material for children's teeth, for those teeth that are so hard to save. I mean the white, chalky teeth that are affected with the lighter colored caries. The chemical or electrical theories of Dr. Palmer, of Syracuse, are very interesting, and to me open up quite a new view of the material and filling teeth question. I cannot question his reasoning nor his results, because I do not know enough of electrical science; but in the class of teeth I have referred to, my Amalgam fillings, introduced with care, mixed carefully, and burnished with layers of tin foil or a bit of sponge gold, do not fulfill the conditions, and appear to only temporarily arrest decay; for in a year I find the borders, in too large a proportion of cases, indicating fresh destruction. Hill's stopping, or oxychloride of zinc, though regarded as only temporary fillings, do arrest the disease, though the fillings themselves require frequent renewal. Indeed, even in children's teeth, though as good an authority as Dr. Kingsley, of New York, expressed himself against it, considering "gold the very *worst* material for children's teeth," I find gold better than Amalgam. Gold as soft foil, or in soft cylinders, wedged into a cavity with not too great force, nor too much time occupied. In the bicus-

pids and molars of pale-faced, light-haired young girls of fourteen or sixteen years of age, with soft chalky teeth, I have patiently tried gold and Amalgam, and though gold has answered a little better than Amalgam, I have finally resorted to the temporary stoppings, demanding examinations every three months. Of course these statements are taken from irregular experiments; that is, not from regularly numbered and tabulated experiments, nor can I give statistics. The record is only a little over three years old, but it has been enough to satisfy me that with my method of manipulating Amalgam—and I have tried the old way of washing and squeezing, and the new way of adding enough filings to the mercury to make a dry plastic mass, and with the modern Amalgams, I do not consider Amalgam a reliable material for these chalky teeth that require, above all others, a chemical and electrically good material. To resort to the old silver coin Amalgam or the native way of arsenic and this old Amalgam is too shocking to the sense of beauty, but for an electrically good filling—one that bears the correct relation to the tooth, and will slay the enemy, caries, this black demon seems to be superior. Shall I throw away my Amalgam after using it nearly fifteen years? No, for in badly decayed and broken molars, where the quality of the teeth is what a merchant would call from fair to middling or prime, this is the best material I know. We need just such a plastic material in just such cases. Dr. Abbot, of Berlin, has recommended a chemical filling—the sheet of tin and sheet of gold foils rolled together and introduced by lateral pressure and wedging. Other dentists in Europe have spoken and written in favor of this combination, and Dr. Palmer, in a former article, complimented his brothers in Europe as having the facts minus the science when referring to this tin and gold filling. The writer has a little drawer of this gold and tin prepared for use, and has employed it as cylinders in a few cases of crown cavities, not enough to speak confidently about it, though these cases were successfully treated. In these cases the filling turned nearly as black as the old Amalgam above spoken of, though the teeth were not discolored. If blackness of color is a necessity in these white chalky teeth, perhaps a good solution of nitrate of silver as a daily mouth-wash would prevent decay and avoid the necessity for filling at all—why not? In cases of this wasting away about the necks of bicuspid, the nitrate of silver is a valuable remedy, and this disease is much like the white caries of chalky teeth. To close this rather disjointed paper, let us thank Dr. Palmer for his paper, and pray for the coming dentist to appear with his electro-chemico perfect filling for white, chalky, soft teeth. Gold and Amalgam are good enough for teeth of good quality.

CORRESPONDENCE.

PHILADELPHIA DENTAL COLLEGE,

Nov. 26th, 1875.

PROF. J. H. McQUILLEN, M.D., D.D.S.

DEAR SIR : At a meeting of the students of the Philadelphia Dental College, held on the 17th inst., it was unanimously

Resolved: That a committee, consisting of representatives of the various States and nationalities, attending lectures this session, be appointed by the President of the meeting to wait upon you, to tender the compliments of the class, and request a copy of your Address, introductory to the present course of lectures, with such additional facts of interest in regard to the history of the College as you may see fit to add, for publication.

Therefore it is with pleasure that we, the undersigned committee, respectfully solicit, on behalf of our colleagues, a copy of your Introductory Address for the aforesaid purpose.

Very Respectfully,

I. FRANKLIN WARDWELL, *Conn.*, President.

J. THOMAS WARDROBE, *Wisconsin.*

W. S. MAYFIELD, *Texas.*

GEO. HYDE, *Nova Scotia.*

M. J. NOBLE, *Ohio.*

C. N. WEBSTER, *Michigan.*

CHAS. E. DIEHL, *Pennsylvania.*

V. A. KALTENBRUN, *Kentucky.*

R. ATMAR SMITH, *South Carolina.*

R. GRUBB, *Scotland.*

HENRY I. DORR, *California.*

J. F. BAKER, *Illinois.*

C. I. BAILEY, *New York.*

C. ALLGOWER, *Germany.*

F. A. ROBBINS, M.D., *Dist. of Columbia.*

W. ARMSTON, Vice M.B., *England.*

D. B. ROSS, *West Virginia.*

C. F. MALBON, *Maine.*

J. OTTO URBAN, *Prussia.*

G. VON WALTHER, *Russia.*

E. FORBERG, *Sweden.*

C. L. ANDERSON, *Massachusetts.*

G. OSBORNE HANNAH, *New Brunswick.*

C. R. DA C. BELISARIO, *Australia.*

KARL REMENOVSKI, *Austria.*

L. ASHLEY FAUGHT, *Georgia.*

MIGUEL FERREIRA DA SILVA, *Brazil.*

HENRY W. MORGAN, M.D., *Tennessee.*

HENRY F. MARSHALL, *Rhode Island.*

THOS. G. COWARDIN, *Virginia.*

RAFAEL CHAGUACEDA, *Spain.*

JAMES LAWRENCE, *Cuba.*

MAURICE C. SLOCUM, *New Jersey.*

2100 ARCH STREET, PHILADELPHIA, PA., NOV. 27TH, 1875.

MR. I. FRANKLIN WARDWELL and others :

GENTLEMEN : In response to your polite note it affords me much pleasure to comply with your request. With kind regards to yourselves and colleagues, I remain,

Respectfully yours,

J. H. McQUILLEN.

INTRODUCTORY LECTURE TO THE WINTER COURSE OF
THE PHILADELPHIA DENTAL COLLEGE.

SESSION 1875-6.

By J. H. MCQUILLEN, M.D., D.D.S., Professor of Physiology.

GENTLEMEN : It is my pleasing duty to welcome you, in the name of my colleagues, to the Philadelphia Dental College. The utterances indulged in on occasions such as this, year after year, afford little opportunity for original observations, and are, indeed, regarded by many as mere platitudes, having little or no meaning. I envy, however, neither the head nor the heart of the man who can regard with eyes of indifference a scene such as this ; for to one who truly loves his profession what sight can be more gratifying than that which is here presented, of an assemblage of manly hopes and energies, not only from the remotest quarters of our wide-spread country, but from far distant lands, gathering with one accord to a common centre, with the express object of obtaining a knowledge of that science to the advancement of whose interests one's own life and best energies have been devoted ?

It is delightful to establish relations of friendship with such an assemblage of sensitive and intelligent natures—to feel in your own heart a glow of kindly interest in their aspirations, and to believe that from each bosom there is a flow of warm interest toward yourself mingled in its emotions. It is a high and a noble privilege to be a leader of such a band, and one may feel justly proud of the distinction of thus being selected by them for that position. To one who fully recognizes the grave responsibilities of a teacher, while such thoughts must necessarily make their impression, the fact that he is called upon to aid in moulding the character, and shaping the destinies of those who have accepted him as a leader, brings with it a painful sense of the responsible duties devolving upon him ; for, as Sir Thomas Watson has justly said, “ Doctrines and maxims, good or bad, flow abroad from a public teacher as from a fountain, and his faulty lessons may become the indirect source of incalculable mischief and suffering to hundreds who never heard his name.” Not only is this true of those who go forth from him as practitioners in their relations to the community, but it must also be remembered that the students will, in due course of time, become the teachers of others, either as private preceptors or as public instructors, and error may be thus propagated to wider and wider

circles. Impressed with convictions such as these, my aim has ever been to avoid a dogmatical manner of presenting the science of Physiology to others, and rather to teach them to *study, observe* and *think* for themselves, and never to be mere blind followers of authority. Appreciating the advantage a teacher enjoys in imparting instruction to those with whom he has established relations of friendship, it is always my desire to be regarded in the light of a friend by those whom it is my duty to instruct. In extending to you the right hand of friendship I feel that it is not to strangers, for many of you have returned a second time to the institution to continue your studies with us, while others are the sons and students of valued friends, occupying leading positions in the profession in our own and foreign lands, who have desired me to take an individual interest in your welfare. Your presence here in such large numbers, and from such varied regions, is additional evidence of the confidence the profession has manifested, session after session, in the course of instruction pursued in this institution, and is the best answer that can be offered to those who, in opposing dental colleges, misrepresent them, and particularly to the *Remonstrance* offered to the LEGISLATURE OF PENNSYLVANIA against the establishment of this College, which I read to you from the printed volume of the "*Legislative Record*," as follows :

PHILADELPHIA, FEB. 13TH, 1863.

TO THE HOUSE OF REPRESENTATIVES OF THE STATE OF PENNSYLVANIA :

"We, the undersigned, citizens of Philadelphia, do most respectfully remonstrate against the passage of the bill now before the Legislature, 'to incorporate the PHILADELPHIA DENTAL COLLEGE.' We make this protest for the following reasons :

"The PENNSYLVANIA COLLEGE OF DENTAL SURGERY is at present in operation in this city. It has for years been supported only by great exertions and sacrifices on the part of those interested in its behalf. The Trustees and Faculty have extended every facility to induce the attendance of students, reducing the fees to a lesser sum than that of any other similar institution, while, in many cases, applicants have been taken gratuitously, and in no case have students been refused admission on account of inability to render compensation. Notwithstanding these inducements, the largest class ever in attendance numbered sixty-three (63), while the average since the College has been in operation does not exceed forty-six (46). During the last two years, owing to the unsettled condition of the country, the class has only numbered forty-

two (42), which afforded little more than sufficient to defray the necessary expenses for the successful operation of the school. Several similar Colleges in other localities have suspended for want of adequate support. Such being the case the establishment of another College in this city will, of necessity, divide the class, rendering the successful continuance of either impossible, thereby depriving the community of the best method of teaching practical dentistry.

“Therefore, believing an additional College not only unnecessary, but detrimental to dental education, we submit the above.”

I omit the names which are appended to the “*Remonstrance*,” and in reading it do it with no unkind feeling toward those gentlemen, or the desire to arouse unnecessary antagonisms; on the contrary, from the origin of this school, recognizing that the world was wide enough for both Colleges, and has need of them, my desire has been to establish and maintain those fraternal relations which should exist between the faculties of institutions having one common aim—the advancement of the cause of education—and that the rivalry existing between them should be of that elevated character in which each strives to do the best it can for its students, by affording to them the most complete course of instruction. This *Remonstrance* is presented here as part of the history of this institution, and of the profession, and as evidence of how persons may be mistaken, for the predictions contained therein have not been verified; on the contrary, the old institution has had a larger number of students since the establishment of the new, than it ever had before, and the average number of dental students attending lectures in Philadelphia, each session within the past few years, has quadrupled the average named in the *Remonstrance*.

In compliance with the request to furnish additional facts in connection with the history of the school, the following, embraced within brackets, is presented. [In the fall of 1862 I tendered my resignation as a member of the Faculty of the PENNSYLVANIA COLLEGE OF DENTAL SURGERY, with which I had been connected for several years. During the succeeding winter, in consultation with Professors J. Foster Flagg, C. A. Kingsbury, Dr. R. Shelton Mackenzie, Literary Editor of the *Press*, Peter F. Rothermel, the historical painter, S. Fisher Corlies, Esq., Prof. Joseph Leidy, and other friends, it was determined to make an attempt to establish a new Dental College in Philadelphia, and Hon. Robert McClelland, D.D.S., a member of the HOUSE OF REPRESENTATIVES OF THE STATE OF PENNSYLVANIA, was written to, desiring to know whether he would take charge of the matter. He promptly responded that if a

bill was prepared he would introduce it to the House and give it his hearty support. Immediately on the appearance of the bill in the House there was naturally an opposition to its passage, as is made manifest in the “*Remonstrance*” presented above. All this, however, had been anticipated, and preparation made to meet it long before its appearance, by securing for the movement the influence of leading members of the dental, medical and legal professions, not only in the city, but throughout the State. Under these circumstances the bill passed the House by a vote of sixty-five to fifteen.

Its passage, however, was more effectually resisted in the SENATE ; the committee to which it had been referred being a divided one in their opinion as to its merits. Having been requested to come to Harrisburgh, to appear before the Senate committee, and to give reasons why such a bill should be passed, the following argument in favor of it was presented by me in reply to the “*Remonstrance*” which had been brought to the notice of this committee :

“GENTLEMEN : As legislators it is not necessary to remind you of the fact that “competition is the life of trade ;” and this applies with equal force to education. The establishment of a new dental school in Philadelphia need not, of necessity, injure or destroy the old institution ; but on the contrary, may benefit it by arousing it to better efforts in the cause of education. You must recognize the tendency on the part of trade, art, and education to focalize. Thus, we find the shipping of the world concentrating in certain great ports, such as Liverpool, New York, Havre, etc., due to their proximity to the sea. Students of art from all parts of the world seek Rome and Florence to study their favorite pursuit, for here are presented the works of the great masters in marble, and on canvas, thus affording opportunities to obtain knowledge of art which cannot be secured elsewhere.

“Again, we find students of medicine and other sciences from every quarter of the globe seeking the time-honored universities of Heidelberg, Gottengen, Berlin, Vienna, Edinburgh, London and Paris, to acquire a knowledge of the specialties in which they are interested. Why is this ? For the reason that there can be found all the instrumentalities that are necessary to aid them in their pursuit—libraries, museums, laboratories, hospitals, eminent and learned teachers. All this applies with force to the city of Philadelphia, recognized for many years as the leading city in medical education, and attracting to it students from every section of the country. Some forty years ago Dr. Geo. McClellan, the distinguished surgeon, conceiving the idea of establishing a new

medical school in the city of Philadelphia, made application to the Legislature for a bill to charter the JEFFERSON MEDICAL COLLEGE. This movement was at once opposed by the friends of the UNIVERSITY OF PENNSYLVANIA, on the ground that it would prove detrimental to the cause of education, and injure the UNIVERSITY by dividing the class between the two institutions. The bill, however, became a law, the College came into existence, and its successful career as an educational institution is known to all of you. The UNIVERSITY, unaffected by its powerful rival, has maintained its elevated position.

“In place, however, of four or five hundred medical students being educated in our city annually, the number in attendance upon lectures has reached, in some years, over twelve hundred. The establishment of the PHILADELPHIA DENTAL COLLEGE, in place of proving detrimental to the cause of education, or injuring the institution already in existence, will, I have reason to believe, give a new impulse to dental education, and materially increase the number of dental students attending lectures in the city of Philadelphia, and before a decade passes over the number will be at least treble what it has been in the past, embracing students from not only every section of our country, but every quarter of the globe. These views are presented to you as good and sufficient reasons why the bill should become a law.” The following day the committee recommended the passage of the bill, and it passed the SENATE by a vote of twenty-eight to three.

Notwithstanding the large majorities with which the bill passed the HOUSE and SENATE, taking advantage of a clause in the Constitution of the State of Pennsylvania, in which it is stated that any bill passed within ten days of the adjournment of the LEGISLATURE, the Governor may withhold his signature until the next session, if he should think proper, an effort was made to induce Governor Curtin not to sign the bill; if this had succeeded it would have effectually destroyed the movement. A personal interview with the Governor, however, in which I used the same arguments that had been presented to the committee of the SENATE, along with the statement of the highly respectable support which the movement had in every portion of the State from the dental, medical, and legal professions, convinced him that the measure was a proper one, and he at once signed the bill, and it became a law.

The institution came into existence without an endowment either from State, city or private individuals, and was established where it now stands, and has been maintained through the individual exertions of its

Faculty. This has been no easy task, but on the contrary has demanded unceasing vigilance, application, tact, sacrifices of time, money, ease and pleasure. As evidence of this, the original Faculty of the College, Professors J. Foster Flagg, C. A. Kingsbury, Thos. Wardell, Henry Morton and J. H. McQuillen paid \$700 a piece—\$3,500 in the aggregate—to deliver the first course of lectures in the College to *eleven students*. This money was cash advanced, and did not include the cost of valuable specimens, apparatus, etc. (belonging to individual members of the Faculty), nor the loss of time in practice. The receipts from the students who attended the the *second term* were nearly sufficient to cover the expenses of that session, and an additional assessment of only \$50 on each member of the Faculty—\$250 in all—was required for the *privilege* of delivering *that course* of lectures. Each succeeding year, valuable specimens and apparatus have been added to the museum; and in anticipation of the eighth session, with the view of obtaining sufficient room to afford ample accommodation for the large increase in the size of the class, the Faculty made additions and improvements in the College, which cost \$4,000 in addition to the ordinary annual expenditure, and they lectured that session without any pecuniary return. The maintenance of a dispensary and laboratory, such as those connected with the College, which gives the students the fullest possible opportunity of acquiring a practical knowledge of Operative and Mechanical Denistry, and affords at the same time, valuable service to the indigent portion of the community, requires a large annual expenditure that makes a heavy drain on the institution.

Truly may it be said that the occupancy of a professorship in a dental college is an expensive luxury, and that no one would continue to hold such a position, year after year, unless animated by a more than missionary zeal that is demanded in delivering regular and systematic courses of lectures to classes so small that the prospect of ultimate success must appear impossible to any other than enthusiasts. During the twelve years the College has been in existence important changes have taken place in the Faculty, by the retirement of various members (until only one of the original Faculty remains in it), on account of the tax upon time, in the preparation and delivery of the lectures, interference with practice, exhausting energies, or failing health. Leaving their positions with regret, these gentlemen maintain a warm interest in the success of the College, as is made manifest by the valuable service rendered by Profs. FLAGG, GARRETSON and KINGSBURY as clinical instructors. The places made vacant by their resignation have been most appropri-

ately filled by my present able colleagues. In this connection it may not be amiss to direct attention to the fact that in place of seeking to borrow lustre from connection with other institutions, it has been the high distinction of this College to give from its Faculty to the STEVENS INSTITUTE at Hoboken, New Jersey, the celebrated Prof. Henry Morton, the chief of that institution, while Professors Harrison Allen and S. B. Howell, since their connection with the PHILADELPHIA DENTAL COLLEGE, have been appointed by the Trustees of the UNIVERSITY OF PENNSYLVANIA, Professors in that institution ; the first to the Chair of COMPARATIVE ANATOMY AND ZOOLOGY, the latter to the Chair of GEOLOGY AND MINERALOGY.

From the alumni of the school, Profs. SMITH and STELLWAGEN have been selected for the positions which they occupy in the institution. Desiring to secure the best talent possible to aid in the instruction of the students, the Faculty, uninfluenced by narrow considerations of policy, have placed on the board of clinical instructors, in addition to those from the alumni of our own school, gentlemen who have graduated from other institutions, and whose experience and skillful operations are highly prized by us.

Year after year the class of students has gradually increased in size, until from the first eleven it has passed this session to one hundred and two matriculates. With an endowment fund sufficiently ample to erect a larger and more commodious building, there is no reason why a class of double that size could not be instructed. A movement in that direction has already been inaugurated by the alumni, and a small sum subscribed. If it were possible to obtain an appropriation from the State, and donations from private individuals, such as those with which other institutions of learning have been favored, this could be readily consummated. Our just claim to such consideration, on the part of the State and private benefactors, is not merely the instruction imparted to our students, but the valuable eleemosynary services rendered to a suffering and indigent portion of the community.]

The success that has attended our College, like Leyden of old, in attracting students from every quarter of the globe, is largely due to the fact that our alumni, both at home and abroad, never forget their Alma Mater ; but, on the contrary, are ever using their influence in its behalf. Your presence here is an illustration of that sentiment. This feeling is reciprocal ; for wherever our alumni go, they carry with them the best wishes of their Alma Mater, and this interest is maintained year after year, and the cold shoulder is never shown to them. In addition

to this, we have been fortunate in securing the confidence and support of the profession at large and of those practicing in our midst, who have every opportunity of observing the methods of teaching made use of in the school. This is the more gratifying, as some of them are not graduates of our institution. In this great city, where two of the best medical colleges in the world are located, these gentlemen, skillful practitioners, and men of matured experience, throw their influence in favor of dental colleges, notwithstanding the outcry of some members of the profession that the curriculum of instruction in the dental colleges is not sufficiently extended. It is difficult to understand why those who are advocating the importance and necessity of a thorough medical education on the part of those who are entering the profession, do not set the example themselves by attending courses of lectures and graduating from the *best* medical schools in our country; for many of them are neither graduates of medical or dental colleges. I do not wish to be understood as opposing medical colleges or the establishment of dental departments in connection with them; on the contrary, as I have said elsewhere: "If a better course of instruction could now be secured by connection with medical schools, I would not stand in the way. But the question is, Can that be done? In dental colleges theory and practice go hand in hand. But the same facility is not found in the medical schools, indeed cannot be granted in the general practice of medicine and surgery, and it may be that the dental departments would be equally defective in practical instruction. Medical graduates go out to learn the art of medicine, and woe to the community where the tyro has to practice! The graduate of a dental college is to a certain degree prepared to practice. If the dental colleges are not what they ought to be, sweep them out of existence. If they fail to properly educate the student for practice, then close them up. The all-important question is not whether the student receives an education which will entitle him to recognition on the part of medical men, but whether *he is properly fitted to go forth and serve the community as a practitioner of dentistry*. If dental colleges do this, and I believe they do, they should be encouraged and supported."

Having spoken to you of this institution and dental education in general, let me say to each of you, have you asked yourselves the important question: Am I physically, mentally and morally fitted for the practice of dentistry? You may reply, Why ask such a question now? To this I would say, seeing that there are so many persons in this world who make the mistake of engaging in occupations for which they are

not fitted, it is a matter of the gravest moment, when starting out on a new career, to be sure that you possess all the elements that are demanded to secure success. There is an idea entertained by many that our profession is a light one, and a knowledge of it easily acquired, and that it is particularly adapted for persons of a weak physical organization. Let me correct in the outstart such erroneous impressions, if entertained by any of you: for marked success in our profession *demands not only the inclination, but also the capacity for labor*. It requires in the performance of its varied duties physical and vital powers of no ordinary nature, for the cares, the anxieties and the strain upon mind and body in the practice of the profession test one's metal to the utmost. A good physical organization is therefore needed to begin with; in addition to this the studies, theoretical and practical, you are about to enter upon here, if faithfully prosecuted, will tax your mental capacities and physical powers to the utmost, for the education of the *head* and the *hand* must be carried on together. A clear, cool, well organized brain is needed, capable of engaging in abstruse studies and of passing from them to the practical manipulations of our profession. In the lecture room, in the "quiz" classes and in the privacy of your rooms, you will prosecute your studies, while in the dispensary and the laboratory there will be the fullest opportunity afforded to acquire a practical knowledge of the profession. See to it that you take full advantage of all these opportunities.

If some of you are naturally quick in learning, do not presume on that fact, and, after attending a few lectures and reading a few pages, imagine that you can acquire the whole theme, with but little effort on your part; or after filling a few teeth and constructing two or three dentures, think that you have mastered the practical part of the profession. On the contrary, *apply yourselves diligently to your studies and engage daily in your practical duties*. Knowledge does not come to the dreamer or skillful manipulation to the idler. In pursuing your varied studies and in engaging in your practical duties, let me impress upon you the importance of *concentration of mind*. In other words, think only of what you are engaged upon, and dismiss for the time being everything else from your mind. This power of concentration will not only be of advantage to you here in pursuing your studies, but will prove an element of strength and success when you enter upon practice, particularly if you acquire along with it the faculty of passing readily and at times rapidly from one thing to another (frequently of the most opposite character), with the ability to completely dismiss the one and

enter upon the other with the clearest conception of all that is required. When a lad, a friend presented me with a copy of "Lord Chesterfield's Letters to his Son." In one of these there was a passage on this subject which made a marked impresssion at the time, and has been of service to me throughout life. It was as follows: "When at church do not think of the young lady you danced with at the ball, and when at a ball do not think of the last sermon you heard." He meant, in other words, do not be absent-minded, and whether it be work or pleasure, have your mind on what you are doing. The student who engages in his studies with a divided attention cannot acquire knowledge as quickly or as thoroughly as one whose mind is completely absorbed by it, and, when an occasion arises for its employment, will find he has the most vague and indefinite remembrance to fall back on. It is not the number of pages a student reads that benefits him. One man may skim over an entire book, and be none the wiser of its contents, while another, reading but a few pages and understanding them, is prepared to continue his studies with advantage. In pursuing your studies you will find them based upon a series of facts clothed in, to you, a new and strange vocabulary. While acquiring a knowledge of these facts and terms, you should recognize the relation that they bear to one another. As Edmund Burke, Britain's great orator, has justly remarked, "Facts are to the mind what food is to the body, and upon the due digestion of these depends the strength of the one and the vigor of the other. The wisest in counsel, the ablest in debate, and the most agreeable companion in the commerce of the world, is he who has assimilated to his understanding the greatest number of facts." I know no experience more trying, as a teacher, than the unfortunate manifestation sometimes presented on the part of a student who has acquired a certain number of terms and facts, but without the slightest comprehension of the relation they bear to one another. A person with such mental characteristics is unfitted for scientific pursuits, and should be advised to abandon the attempt to prosecute them.

It is not an uncommon thing for students who have a fair share of natural abilities, but who are unaccustomed to prolonged and systematic study, such as that which is necessary in a collegiate course, to become frightened at the magnitude of the work, and in a moment of desperation, determine to abandon their studies and to return to their homes. An experience of over a quarter of a century, as a student and a teacher, has made me acquainted with the aspirations, the hopes and the fears of students; and enables me to realize the feelings of those

who are just entering upon their studies. To such I would say, do not become unduly alarmed at the work before you, as it no doubt presents itself to your mind, en masse for the entire session, and come to the conclusion that it will be impossible for you to master it. Learn to conquer, as Napoleon did, in detail, and, as he by rapid marchings and counter-marchings, succeeded in dividing his enemies' large armies into smaller ones, and then, by concentrating his entire force upon these, destroyed them division after division, so do you, day by day, fix your minds only upon what is demanded at that time, leaving the studies and duties of to-morrow until to-morrow comes. If an ox should be presented to you and you were told to eat it, you would pronounce the thing impossible; but taking beefsteak by beefsteak, in the course of a lifetime you would be able to consume several oxen. So is it with your studies, conquering in detail day after day, by the end of the session you will have passed over the entire field, and made yourselves acquainted with it. I recall an instance (one of several) which occurred some years ago, in which a fine young man from one of the Eastern States, where he had been in successful practice over five years prior to entering college, called upon me a week or two after the opening of the winter session and said he was going home, as he did not feel that it would be possible for him to succeed in his collegiate course. After some conversation, and finding him a man of good mind, fine physical organization, and having had a thorough endorsement of his moral character from his friends, I gave him such advice as I have here presented, telling him, at the same time, to be careful in regard to his diet, exercise and rest, and above all to keep his mind calm. Encouraged by this, he decided to remain, became one of the best students of that session, graduated with honor, and is a leading practitioner in the State where he lives.

You should understand the value of time, and how important a systematic apportionment of it will be, if you desire to succeed as students and practitioners, and also appreciate the value of those odd moments that are wasted by the majority of persons, when, by the unpunctuality of others, or circumstances beyond their control, the plans they have arranged are interfered with. These fragments of time in the aggregate swell into hours, days, weeks, months and years of one's existence, and if promptly and profitably appropriated, prove of inestimable value. The biographies of eminent writers and scientific investigators are full of illustrations of this, and prove that the immense work accomplished by many of them was due to the fact that they knew how to make use

of such moments ; and that the time wasted by others in indolence or pleasure was appropriated by them to labor, generally extending far into the night. I would not wish to be understood as insisting upon unceasing labor, or objecting to innocent pleasures ; on the contrary, mind and body must unbend at times, and are benefited by such relaxation. This leads me to say that in leaving your homes you are removed from the surveillance of that excellent police system, the eyes of your friends and neighbors, who have watched your outgoings and incomings heretofore, and which, superadded to the excellent principles inculcated at home, have kept your feet in the right path. You are to be subject now to the temptations of city life, and those principles will be put to a severe test. As the fire tries the pure gold, may you come out of this unscathed. I am not one of those who believe that great cities are mere sinks of iniquity, and that purity and elevated morality are to be found in the rural regions alone ; on the contrary, good and bad can be found in both ; the principal difference between them is that the temptation and the opportunity combine more frequently in the former than in the latter. On every side you will find those who are ready and willing to lead you astray, and to induce you to waste your time, money and health ; I would not have you become unduly suspicious of your fellow man, but would advise you to be cautious in responding to the ardent advances of either sex, particularly when they manifest an unusual interest in the welfare of one who is an entire stranger to them. In the darkness of night there are those prowling about who would be only too happy to rob you of health, strength and self-respect. On this point I would commend to you the perusal of what Solomon says in the seventh chapter of Proverbs. Think not because you are among strangers, that what you may do will be unnoted ; on the contrary, your action in the right or the wrong will be duly recorded. For, as animals in passing over the soft mud of primeval days, left the impressions of their feet on it, which became hardened into stone, and have lasted throughout the ages, so you, in the plastic condition of early manhood, will take the impress of good or evil associations that will remain throughout life. The profession you are now studying is one in which the highest and holiest trusts are confided by fathers and husbands, when placing in charge of its practitioners those who are dearest to them ; it demands, therefore, that they should possess the purest moral character. Can this be expected of those who, in early manhood, find pleasure in the society of the dissolute ? You cannot be devotees of science and followers of pleasure at the same time ;

as Goëthe hath said, "That you may spend in some directions, you must save in others."

That you may have a sound mind in a sound body, it is necessary to take a certain amount of daily exercise in the open air, particularly those who are here from the rural districts, and who have been accustomed to out-door life. There is generally a disposition on the part of students to secure their boarding-houses as near the college as possible, and sometimes letters have been received asking if they could not be accommodated in the college building. This is a mistake, for it is better, far better, that the residence should be a considerable distance from the college (than near to it), so that it will be an absolute necessity to take rather a long walk. There is no better exercise you can engage in than walking. While doing it, not only are the muscles brought into active play, but the lungs are performing their duty with increased vigor in the proper aëration of the blood, which carries to the nervous and muscular mass that invaluable stimulant, oxygen. This leads me to direct attention to having the rooms which you occupy in your boarding-houses properly ventilated, for you cannot study with advantage or rise refreshed from your slumbers after breathing the impure air of a close room, contaminated by the emanations from your own lungs, and of those who may occupy it with you; a window let down a little from the top will effect this desirable end. Having advised you with regard to the necessity of exercise, it is but proper, on the other hand, that you should be reminded of the importance of taking a proportionate amount of rest. From six to eight hours of the twenty-four should be devoted to this.

In conclusion, the suggestions which have been made to you are based upon an experience of many years' association with students, in which their aspirations, their needs, and the dangers which surround them, have become well known to me. Offered to you with the kindest feelings, I trust that they will be received in the same spirit in which they have been presented.

THE largest flouring mill in America, it is said, is owned by Hon. C. C. Washburn, of Minneapolis, Minn. It is seven stories high, and crowded with machinery from top to bottom. Its cost was \$300,000, has forty run of burrs, and turns out one thousand barrels of flour per day.

NEW YORK ODONTOLOGICAL SOCIETY.

Regular meeting of the Odontological Society was held at the residence of Dr. S. G. Perry, on Tuesday evening, October 17th, 1875.

Dr. S. G. Perry : About two years ago Dr. Edward Maynard said to me that he thought there was something in store for us in the way of an improvement in steel. He referred to chrome steel, which he thought promised greater toughness, and therefore better cutting qualities than any yet in use.

Acting upon this suggestion I procured from the Brooklyn Chrome Steel Works a bar about six feet in length and one-half inch in diameter, which I had drawn down to the proper size, and tapered, ready to be shaped and tempered. Following the directions of the printed circular sent out with the steel, I carefully tempered these instruments, and after a daily use for a year and a half, I feel safe in saying it is the toughest steel, and will hold an edge the longest of any of which I have any knowledge.

I have used, to a considerable extent, Stubbs' fine steel wire, which makes remarkable cutting instruments (as any one who has ever seen instruments of Dr. Maynard's make and temper can testify), but I can get an edge with chrome steel that will stand longer than any I can make of this highly carbonized and high priced steel.

Chrome steel is made by an admixture of chromium, which unites inseparably with the iron, so that there is no danger from overheating, as with carbonized steel.

It requires the same treatment as ordinary steel, except that it should be tempered at a lower heat. Considerable care is necessary to find just the degree of hardness it requires, and occasionally, an instrument may have to be re-tempered in order to get a lasting edge.

In order to get uniformity, close attention should be paid to the light in which it is done, always endeavoring to have it the same. It is also well to have the temperature of the material in which the steel is plunged always the same. Except with very small excavators, which require a spring temper to give sufficient strength in the shank, I heat the extreme point to the degree of redness I desire, and plunge, and then use, without drawing the temper, having in this way an instrument that can be easily bent with the pliers, suiting it to the exigencies of any case, and yet having stiffness enough in the shank for cutting purposes.

I harden sometimes in beeswax, but oftener in a cake of perfumed

soap, which gives an excellent temper, and a delightful odor, which is of some consequence if the work is done at odd moments in the office.

Many of these instruments designed for hard cutting I make by filing the round, straight "flanks" to the size I want my cutting edge, and after *polishing* highly for a little distance from the end, bend to any angle I desire, and after tempering, sharpen these round instruments so as to make rights and lefts, as well as those that cut toward or from the hand. In sharpening, it is necessary only to hold the instrument always at the same angle on the stone, and the outer surface being highly polished, is always ready to take a sharp edge.

These instruments, sharpened at obtuse angles, may be tempered very hard without danger of breaking, and their cutting power is greatly in excess of the ordinary excavator. Rights and lefts, of different sizes, made in this way, are very serviceable in cutting out transverse fissures on the surfaces of molars, while longitudinal fissures may be quickly cut out by those sharpened on opposite sides, so as to be used with a push or draw stroke.

With chrome steel instruments of this form it is easy to cut through dense enamel that effectually resists the burr. They are serviceable in nearly all classes of cavities, except, perhaps, the deeper portions where an ordinary hatchet-shaped excavator can be better used.

Round polished "flanks," bent with a right and left corkscrew turn (of different degrees of quickness of twist), and sharpened in the same way, are very effective, and can be used in a surprising number of places where the hatchet is generally used. With these corkscrews, of course, the direction of the cut will be determined by the side on which they are sharpened, one side, in cutting, tending to feed in, the other, out. All of these round instruments cut a half round groove into which gold can be thoroughly and easily packed.

I also wish to call your attention to an anvil I have designed, and which I find of great use in giving uniformity of shape to instruments made upon it. Being octagon in shape on the sides, it gives an opportunity of getting, besides the main face, eight additional faces, which are made by taking off the corners at different angles. The angles are four equal divisions of a half circle, so that by laying the shanks of the instruments across the main face, and striking the points over the different angles, it is easy to secure all the shapes that can be needed. On one side, the four small faces join the main face by nearly a sharp edge or corner, while on the other side the faces of the similar angles have the edges or corners rounded over. These faces being

highly polished, it is easy, in striking up instruments over them, to leave the steel on the under side thoroughly condensed and polished, and ready to take a fine cutting edge.

By the use of this anvil favorite shapes can be duplicated indefinitely, which is of considerable moment, so quickly does the slightest change in shape affect the feeling of the instrument in the hand.

For the idea of an anvil having faces of different angles I am indebted entirely to Dr. John B. Rich, who has, by this means, made a most admirable classification of instruments. I have simply combined in more convenient form (and with some variation of angles), the faces which he has produced in separate anvils. Being but two and a half inches high by three in diameter, it is most compact and convenient.

Dr. Corydon Palmer : My first acquaintance with chrome steel was nearly four years ago, at Cincinnati. I then obtained a specimen of it, intending to experiment with it, but did not find time. Not long since, however, I went to the Chrome Steel Works, where I was kindly shown the process of tempering this kind of steel. It is placed in an ordinary soft coal fire, such as smiths use, heated up to a low redness and then cooled in water. This steel in a bar of perhaps an inch in diameter, required an unusual amount of force to break it, and when broken showed a very fine fracture. I obtained a specimen of their No. 1 Tool, or razor steel, took it home, and forged it into cutting instruments and pluggers—pluggers with delicate points, such as I thought would test it most severely, and I found upon testing those instruments that they had greater strength than any instruments I have ever used, of similar shape.

It is a little harder to forge than ordinary fine steel, but there is not any liability of injuring it by overheating.

Dr. J. S. Latimer : I recall a little item that appeared in the *Dental Cosmos* of two or three years ago, concerning this material. It stated that Dr. Vanderweyde exhibited before the Polytechnic Institute a knife-blade made of chrome steel ; with it he shaved the edge off an ordinary knife, showing that it is very much harder than other steel.

Dr. C. Palmer : On the 21st of October a lady came to my office with her little son, seven years old. She had extracted the two permanent inferior central incisors with a piece of strong cord, thinking that they were temporary teeth. She was considerably troubled about what she had done, and wished me to see if I could in any way repair the injury. I put the teeth in warm water for a few minutes, and after

cleansing the sockets, replaced the teeth. I saw the little boy daily for some time, and then the parents sent him into the country. I saw him some two or three days ago, and everything seemed to be doing well. The gums are of good color, look bright, and the soundness of the parts is evidently being fully restored.

Dr. W. H. Dwinelle : I am reminded, by Dr. Palmer's remarks, of my early practice. Many years ago I was induced to make similar experiments. I did some ridiculous things, but I also did some which were quite extraordinary. I never attempted, as has been done, to transplant teeth from one person's mouth to another's, but I made experiments in the direction of removing teeth from the mouth and returning them. I recollect I had a hired girl who permitted me to take out a molar tooth. This tooth remained out twenty-four hours. I kept it in warm water, not allowing the temperature to change, and replaced it. When I came to do so I found that granulation had taken place ; the socket was in a measure filled up, and I had great difficulty in getting the tooth back to its place. This tooth occasioned the person great annoyance, and it was only by much persuasion that I could induce her to allow it to remain a couple of weeks, when I removed it. The fact, however, that this can be so far accomplished, illustrates the tendency in nature to adapt herself to extraordinary conditions.

I recall, also, other cases where I made similar experiments, in which I followed the fortunes of such teeth for a series of years, and I found that they lasted, on an average, about eight years after such operations. They eventually became loose, and on removal I found in several cases that absorption had taken place of a considerable portion of the root, and occasionally the root would be perforated with holes. In several instances I extracted teeth, and, while they were out, removed the pulp and filled the nerve canals, returned them, and had them do very well ; but I found that I succeeded best when I clipped off a little portion of the extremity of the root.

(Concluded in next number.)

VON BULOW, the pianist, says beer drinking is the great fault of his countrymen. They do not get drunk, but drink till their blood becomes sluggish and their brains stupid.

REMARKABLE COINCIDENT DISEASE AND DEATHS.

THE EFFECTS OF HEMLOCK, ETHER AND IDIOPATHIC CAUSES.—THE
VALUELESS MEDICAL CHARACTER OF OUR CORONERS' INQUESTS.

By A. C. CASTLE, M. D., New York.

The recent coroner's inquest in relation to the cause of death in the case of Mr. John H. Hallock—who died while under the effects of ether, administered for painlessly removing the dead bone of the left upper jaw, again calls our attention to the utterly valueless character—beyond their *mere* lego-official technicality—of the “Crownor’s Quests” mode of medical investigation into the various causes of death brought within the coroner’s jurisdiction.

It is a sad reflection that our politico-social pathology so warps our understanding that while we concede that education, honesty and virtue are of the greatest importance in securing individual progress and prosperity, they are the very last qualities to be considered as a recommendation for filling even the meanest office of public preferment.

What is the system of our elective “selection”? We have in our midst gentlemen of high social position, medically educated, and possessing a thorough knowledge of all the collateral sciences relating to medical jurisprudence, and hence, the most proper persons to perform and fulfill the duties demanded of a properly educated coroner. Is such a one ever selected? We find, on the contrary, that an “enlightened public” furnishes ward politicians for coroners (the fees and perquisites* being their reward for partisan service)—whose only credentials of merit, and of the capacity necessary for the exercise of their functions, is in their local political influence.

Professor Chandler, President of the Health Department—a gentleman whose attainments are those of the ideal coroner—gave his views, before the Senate Committee of Investigation, of coroners and their office, in the following words: “*I think it would be very beneficial to place coroners under the control, or as a bureau of the Board of Health, and it would also be highly advantageous to have none but physicians as coroners.*”

* The late Mr. A. Jones—the first to originate Dental Depots—died suddenly. During the temporary absence of myself and Dr. Dorsey, his medical attendants, and in the absence of Mrs. Jones, the coroner held a hasty inquest without seeking any evidence. The jury (!) consisted of *three* dentist’s office boys happening in at the time. The coroner was about removing the body to *his* undertaker’s stables, when, happily, I made my appearance, and by a bold attitude of “moral suasion,” I prevented myself from being committed to prison, and saved the body of my good old friend from outrage and degradation; as well as secured the estate from being “perquisited” out of some thousand dollars for “legal” and “funeral” expenses.

The remarks of Professor Chandler sustain my position. The honest performance of the judicial functions of the coroner—higher than those of the sheriff—are essential to the personal security of every citizen, from the lowliest to the most exalted, and none but men of eminent abilities should be allowed in the position.

The late "Mr." (Surgeon) Wakley, Member of Parliament, proprietor and editor of the *London Lancet*, and for forty years coroner for Middlesex, London, gave the world an example of what a coroner ought to be. From the inquests of such a coroner we learn how much valuable knowledge it is possible to obtain from proceedings philosophically considered, and how superior it is to that sought for in the miserably cruel pseudo-experimental vivisections by which students of medicine are amused for the nonce—not instructed! I ask of any physician, from Dr. Payne—the oldest practicing physician in this city and State—down to the last matriculating fledgling seeking scientific *pabulum* in medical investigation: If in any instance they have derived a particle of insight as to the *cause* of death from any of our coroners' inquests. The coroners generally hide their ignorance by verdicts of "died by causes unknown," "died by the visitation of God," &c. From the unskillful rough vivisections of the assassin's pistol and knife we learn that a man—"Bill Poole"—can live ten days with a bullet in the apex of his heart; and that perforating the brain of a man with a leaden ball is not altogether disadvantageous, for it doubles the power of his visual organs, and that stirring up the brain with a probe (in search of a bullet) affords a novel, but capital electro-magnetic application to the *substance* of the sensorium for attracting, or rather extracting, the bullet *which is never found*. The *post-mortem* examinations of the bodies of Dr. Frederick W. Walker, Mr. John H. Hallock, and Vice-President Wilson, present similar pathological phenomena; but a singular gradation of lessening abnormal conditions in each case—resulting in death.

The *post-mortem* examination in Dr. Walker's case demonstrates the following condition—see report—"a good deal of *venous congestion* in the brain, *Falx-cerebri* slightly thickened and opaque, *Arachnoid* and *pia mater* very much thickened and vascular and easily removed from the brain substance. *Cruræ cerebri* slightly soft. Right crus tore being softened, *right vertebral artery* abnormally long, and had undergone *calcareous* and *atheromatous* degeneration; left *vertebral artery* smaller than normal, had also undergone the same degeneration. Basilar artery larger than normal, with *calcareous* and *atheromatous* degeneration, the *post cerebral* and *middle*

cerebral both undergone *calcareous* and *atheromatous degeneration*, a *small foreign growth found on the pia mater*, *choroid plexus very vascular and thickened*—(i. e. enlarged)—*otherwise*, says the expert, “the brain appeared *healthy*, weight of brain, 57 ounces.” (Vice President Wilson’s brain 49½ ounces.)

“Lungs very much congested—*perfectly full of blood*—(!) I do not mean hypostatic (?) congestion, they were exceedingly soft.” *Kidneys slightly congested*—“*In my opinion*—says the demonstrator—the cause of death was poison by *conium* producing asphyxia affecting the circulation of the blood so as to produce a *scarcity of breath*. *I have never used conium*, I have seen other physicians use it, *but have not been able to judge of its effects*; suffocation from any other cause than the taking of *conium* would probably have produced the same appearance of the remains.” Did Dr. Walker die from the effects of the vast degeneracy of his brain and the lungs being perfectly full of blood—or did Hemlock administered to him cause his death; and is Hemlock a violent poison?

DEATH UNDER THE SCALPEL is the caption of the newspapers’ report of the inquest held upon the body of Mr. John H. Hallock, who died while under the effects of ether, during a surgical operation of removing the necrosed bone from the left upper jaw. The medical evidence is, that Mr. Hallock had been suffering six months ago with a diseased tooth—what the disease was is not stated. “When about six weeks ago”—previous to his death—“acute pain in the jaw began to annoy him. He consulted a ‘local’ dentist.” Whether he treated the tooth is not stated. “He ultimately consulted Dr. Helmuth, Professor of Surgery, who found Mr. Hallock suffering with *necrosis* of the superior maxillary bone.”

The report of the coroner’s *post-mortem* states that “the *brain*, the *lungs*, the *kidneys* and the *liver*, &c., all were *much congested*, and eliminated a strong odor of ether; that the *heart* was very *small* and affected with *fatty degeneration*, *which fact*”—says the report—“could not be diagnosed during life.”

This very imperfect report says nothing whatever about the necrosed jaw bone, to what extent the necrosis invaded the adjacent parts, and what parts—if any—were affected or implicated in connection with the necrosis, and what was the character of the disease? Did the diseased tooth implicate the jaw bone? Had the tooth been treated by arsenic and the bone poisoned? or was it a malignant bone disease, osteo-sarcoma, or was it the result of struma, or lues venerea? Was there suppuration and was there absorption of pus into the system producing *pyæmia*? The congested state and irritable condition of the vital organs

demonstrated the usual attendant results of pus entering into the circulation and poisoning the blood. The question presents itself: Did Mr. Hallock die from the effects of blood poison causing a general congestion of the vital organs, or from the smallness and fatty degeneracy of his heart, or from nervous collapse, the ether completing their paralysis?

The *post-mortem* report of the examination of the body of Vice President Wilson has no reference to poisons, anæsthetics, or medicine. He died a natural death, the result of organic disease, and derangement of the same organs as in the preceding cases. "Brain, weight 49½ ounces. Sinuses of brain full of black fluid blood; *deposit* of lymph on cerebral surface **: crypt, the size of a pea in each choroid plexus in *atheromatous deposit* in the *arteries at the base of the brain*, and in the *middle cerebral arteries*; *Atheromatous deposit* in each choroid plexus. Lungs, old pleuritic adhesions on left size; *calcareous deposit*, the size of a pea, in the middle lobe of the right lung: *Lungs congested (hypostasis (?)* A small *calcareous deposit* in the *aortic valve* *: stomach empty, *congested* throughout with erosions or abrasions at several points *: *liver congested* and somewhat fatty *: kidneys, weight 8 ounces each, *congested*, &c., cause of death apoplexy."

Here we have three cases presented to us, whose bodies exhibit—as far as is known—almost corresponding *idiopathic* pathological condition of organs, &c. The first is said to have died from the effects of Hemlock, whose *real* properties are unknown—but esteemed a powerful narcotic poison; the other, from the effects of ether; and the last from the effects of apoplexy.

The New York *Sun*, Dec. 7th, says, "Dr. William H. Hammond read a paper, last night, before the *New York Neurological Society*, to a very large number of medical gentlemen, in which he takes exception to Dr. Baxter's report of the autoptic examination of the body of Vice-President Wilson; he is inclined to the belief that his death was not caused by apoplexy, but by the plugging up of some blood-vessel of the brain."

Dr. Hammond has an excellent opportunity here to furnish the Neurological Society, and the medical faculty at large, with a very interesting paper comparing the similitude of results of the autoptical examinations of the bodies of Dr. Walker, Mr. Hallock, and Mr. Wilson, with his views and deductions of the remote and exciting cause of disease, and the proximate cause of death in each case. Such a paper would be of great advantage as inaugurating the utilization of coroners' *post-mortem* examinations—hitherto imperfectly made.

REMARKS ON A CASE IN WHICH A PORTION OF A
TOOTH WAS EMBEDDED IN THE LOWER LIP.

By FRANCIS MASON, F.R.C.S., before the Odontological Society of Great Britain.

It often happens that a case of interest will be well-nigh forgotten until another presents itself which prompts us to refer to the first one. In bringing the following case before the members of the Society, I am the more induced to do so because, in looking through the medical periodicals, I have chanced to find a few other examples closely resembling the one I have the honor of submitting to the meeting. The case is this: A patient, aged twenty-two, applied to me in 1868 at the Westminster Hospital with a swelling of the lower lip on the left side. He had been told he had cancer, and sought advice on that account. It appeared that he had fallen from a scaffolding two months previously, and had sustained considerable injury to his scalp and face, and his lower jaw was fractured. He had been a patient elsewhere, and stated that when he was under treatment he had fits. On examining the part the lip was found a good deal swollen, and rather tender to the touch. I made a puncture, when the knife impinged on a hard substance, which proved to be a portion of the crown of a left lateral incisor of the lower jaw, which the patient said he missed after the accident. It was decayed at the neck, and had sharp edges. The patient recovered, and was only under observation for a few days afterwards. I say I have referred to the medical journals and have found other cases; and with your permission, as they are not long, I will read the particulars of them. In the *Lancet* (May 17, 1862) reference is made to a case in which a canine tooth was found lodged in the thickness of the lower lip, simulating a cancerous tumor. "The patient was a lady, forty years of age, who had always suffered with her teeth, and had but few incisors left, the rest of the jaws presenting roots more or less firmly wedged, and the alveoli more or less decayed. Towards the end of the year 1854 she felt a small tumor forming in the lower lip of the left side, which tumor soon filled the space below the internal aspect of the lip and gum. Pain was subsequently experienced, and a few months afterwards the patient could hardly eat. She sent for M. Landyck, who discovered a large tumor situated as above, and ulcerating. Ablation was not proposed, as the lady was very nervous, and cauterization was resorted to. Whilst using the caustic some time after, M.

Landyck felt a hard substance in the tumor. By then making a crucial incision, he discovered a long root of the canine tooth, covered with a thick layer of calcareous matter. It was placed horizontally, the apex turned towards the lip, and its upper part adhering to the bone. This root being removed, the tumor disappeared, and the patient was freed from all uneasiness." Another case is related in the *Lancet* (October, 1868). The patient was under the care of Mr. W. H. Folker, at the North Staffordshire Infirmary, who has favored me with a note respecting the man. His report is this: The patient was sixteen years of age, a joiner, and was admitted August 29, 1867, on account of a tumor existing in the substance of the upper lip. The swelling was on the right of the mesial line, corresponding to the right central incisor tooth (which was noticed to be wanting), and it seemed to be formed by hypertrophied lip. It caused a good deal of deformity, as the patient was unable accurately to close his lips. The tumor felt hard, but was not painful. On carefully examining the swelling a small aperture was perceived at its base; and on passing a fine probe a hard substance was felt, which was diagnosed to be a tooth. On August 31st, an incision having been made through the tumor, a tooth was found at its base. On attempting to extract it by the forceps it was fractured; this proved to be owing to its peculiar shape, being of a crescentic form, and passing almost at right angles to the alveolus. After its removal, the swelling disappeared, and the patient was discharged on the following day. Then there is another case which I think of interest. It is one of migration of a tooth, and appeared in the *Medical Times* (April 30th, 1864), from the "Union Medicale," No. 142. "M. Delestre related to the Paris Medical Society the case of a lady upon whose palate, opposite the front large molar (which was missing), and about a centimetre from the edge of the gum, was observed a small, rounded, blackened loss of substance which seemed as if it had been punched out. Various surgeons who had seen it had regarded it as caries of the maxillary bone, and treatment had been employed in vain. M. Delestre found, on examination with a probe, that there was not the crepitation produced by contact with caries, and that a certain amount of mobility existed. Passing in a delicate forceps, to his great surprise he withdrew the fang of a tooth, about a centimetre in size, which, proceeding from the first molar, had evidently gone through the substance of the maxillary bone and become placed perpendicularly to the palate. The patient remained entirely well." Mr. Haynes Walton has reported a case in the *Medical Times* (November, 1869), of "a patient, aged thirty-five,

who, three years and a half before, had a fall, and lost his right upper lateral incisor. He had much pain, and a few weeks later an abscess formed, which discharged, through a small opening in the cheek, as well as through the alveolus of a lost tooth. Then another abscess formed, leaving a sinus open in the right cheek. On probing this a hard substance was found. The wound was opened up, and a perfect incisor tooth lying loose in the antrum was removed." I think, sir, the above cases are interesting on account of their rarity, but I bring them before the Society for another reason, namely, that a misplaced tooth, acting as a foreign body, may occasionally be the cause of very severe constitutional disorder. In the first case mentioned it will be remembered there was a history of the patient having had fits. Every member here knows that carious teeth give rise to all sorts of ailments—neuralgia, deafness, blindness, amaurosis, squint, wryneck, closure of jaws, epilepsy, &c., and in connection with these cases I venture to direct the attention of the Society to a paper read by Dr. George Johnson, at the Clinical Society, on November 8th, 1872, showing what small matters will give rise to serious nervous disturbance. The case he speaks of was one in which tetanus with facial neuralgia and palsy, and a recurrence of epilepsy, were excited by a foreign body in a wound on the cheek. The patient was a wheelwright, aged forty-four, who, on July 4th, 1872, was cut on the cheek by a blow from an iron axle that fell upon his face. The wound was strapped by a chemist, and healed, but remained very painful. On the 12th he had an epileptic fit. In early life he had been subject to epilepsy, but, until the occasion mentioned, had been free from fits for twelve years. On the morning of the 13th he had difficulty in opening his mouth. The left masseter muscle felt permanently hard and rigid. There was a scar about three-fourths of an inch long an inch below the left eye, the cicatrix being hard and very tender to the touch. Dr. Johnson believing that there was a foreign body present, directed the house surgeon to cut through the cicatrix, when a sharp, angular piece of flint, nearly as large as a grain of wheat, was discovered and removed. With this the symptoms gradually passed away. Dr. Johnson also related another case of a similar kind. A boy, aged thirteen, was admitted for tetanic rigidity of the trunk and extremities. The symptoms, which had lasted more than a week, had commenced about ten days after a wound on the thigh by a sharp piece of wood. The wound had healed, but the cicatrix was hard and tender. The house surgeon was requested to incise the cicatrix, when a piece of woollen material about the size of a small

pea was discovered and removed. Dr. Johnson remarked that the chief interest of the two cases consisted in the fact that formidable nervous symptoms were excited by the presence of a foreign body of small size beneath the cicatrix of a recently healed wound. In conclusion, I may refer to a case which was under my care at the Westminster Hospital, when I was surgeon there, of a girl who was struck on the head by a rolling-pin, and she was admitted in consequence of having tetanic symptoms. She died of tetanus, and, after death, we found, on removing the scalp, that there was a piece of hair-pin, nearly an inch in length, which was, no doubt, the cause of the tetanus. The case is additionally interesting, because a portion of the rectus abdominis muscle had been ruptured by a tetanic spasm. One other case of some interest I may mention. It is quoted in the "British Journal of Dental Science," (vol. 5), and relates to a molar tooth found lodged in the tongue. "At the battle of Williamsburg," says the report, "a man received a bullet-wound in the lower jaw, which was shattered. After attendance at the hospital, however, the wound healed rapidly. Some weeks afterwards he again presented himself, and on examination it was discovered that a molar tooth which had been knocked out of the jaw had been buried in the tongue." I have nothing to add to the examples that you have permitted me to bring before the Society, and in thanking you for your courteous attention, beg to ask, for my own information, if you, sir, or any members present, have met with cases in which pieces of teeth have remained for any length of time embedded in the lips, or in the cheek, or in any other part? I venture to think that we may learn one lesson, at least, from the instances I have quoted, and it is to look carefully for any foreign body, however small, in patients who have nervous symptoms of an anomalous character.

AMERICAN DENTAL ASSOCIATION.

The next meeting of the American Dental Association will be held in Philadelphia, Tuesday, August 1st, 1876. It is the desire of the officers and members of the Association that the State and local Societies, and the Dental Colleges of the Union, north, south, east and west, should be fully represented at that meeting, in the Centennial year of our national existence. The occasion is one not only calculated to bring about that united brotherhood which we desire as fellow country-

men, but in addition as professional men, the representative character of the organization makes it the most powerful and effective means for the elevation of our profession, in advancing the cause of education. Speaking not for any particular section, or any single interest, but for the profession at large, its recommendations assume a force that no local organization can possibly command. At the time of its inception, in 1859, there were present at the meeting at Niagara representatives from ten local organizations. In the brief period of sixteen years that has elapsed since that, the number of State and local Societies that have been formed and sending delegates to the Association has been increased seven-fold. There are, however, several States in which Dental Societies have not yet been established. It is to be hoped that the profession there will at once move in this matter, and organize State and local Societies, and send delegates to this meeting. The representative basis of the Association demands that none other than those who come with credentials as delegates from State and local Societies and Dental Colleges can be received as members. This, however, does not debar any respectable practitioner, as it is only necessary to unite with a local organization to be sent as a delegate.

The Centennial Exposition, taking place in 1876, is calculated to attract, among others from abroad, a number of our professional brethren, and it is to be hoped that they will make arrangements to visit this country at the time of the meeting of the American Dental Association. If they should do so in sufficient numbers, and participate in the deliberations on that occasion, the Association would assume the character of an International Congress of the profession, a consummation most earnestly to be desired. Invitations have been extended to the profession in foreign countries to unite with us on that occasion. While we should be most happy to receive delegates from foreign Dental Societies, reputable foreign practitioners who may present themselves without the credentials of a Dental Society would be gladly welcomed, and exception of the organic law would be made in their favor.

J. H. McQUILLEN, *Corresponding Secretary.*

CELLULOID SUIT.—We last month gave the decision of Judge Blatchford in the suit against Dr. E. M. Flagg. We are now informed that The Goodyear Dental Vulcanite Co. and Josiah Bacon, on Dec. 23d, voluntarily withdrew the suit, and consented to pay Dr. Flagg's costs, rather than pursue the case any further. Of course this is not the end of litigation on the part of the Vulcanite Co., who seek to establish that the use of celluloid is covered by the Cummings' Patent. But it is some gratification to see that their claims are not taken for granted, and are not certain to be established.—[1] .

NOTES.

In our February issue we will announce a subject for Prize Essays, and offer a premium for the best.—[ED.]

False Degrees.

EDITOR OF THE LONDON DAILY NEWS.

SIR.—I desire to call attention of the British public to a systematic fraud which it is proper should be thus exposed, and, if possible, the perpetrators of it punished. Ascertaining that persons have been engaged in this country in selling degrees or diplomas purporting to be conferred by certain American Colleges and Universities, and being satisfied that these distinctions and honors were pretended and spurious, I have made the imposture a subject of correspondence with my Government. Inquiry has been especially made in relation to "The Philadelphia University of Medicine and Surgery," and "The Livingston University of America"—institutions so called—of which there are professed agencies in London and elsewhere. I append copies of letters of the Governors of Pennsylvania and New Jersey, the States in which these Universities are respectively described as being situated, and have to request that you will publish them with this note.

I am, very respectfully, your obedient servant,

ROBT. C. SCHENCK.

Legation of the United States, London,
Nov. 3d.

HON. HAMILTON FISH, SECRETARY OF
STATE.

SIR.—In answer to your communication of October, 9th instant, I have to say that there is no Act of Incorporation in this State of a "Livingston University of America" at Haddocepheld, nor is there

any such institution at that place, nor anywhere else in New Jersey.

Yours, very respectfully,

J. D. BEDLE.

State of New Jersey, Executive Department,
Trenton, Oct. 12th, 1875.

HON. HAMILTON FISH, SECRETARY OF
STATE, WASHINGTON, D.C.

SIR.—I have the honor to acknowledge your communication of October 1st, making inquiry in reference to an alleged institution with the title "The Philadelphia University of Medicine and Surgery." There is no institution known as such. The charter of an institution by the corporate name of the "Philadelphia University or American College of Medicine" was revoked by the Legislature of this State in 1872, for the issue and sale of diplomas to persons not qualified to receive the same.

Respectfully yours,

J. F. HARTRANFT.

Executive Chamber, Harrisburgh, Pennsylvania,
October 12, 1875.

Massachusetts Dental Society.

The annual meeting of the Massachusetts Dental Society was held at the hall of the Young Men's Christian Union, Boston, commencing on Thursday forenoon and ending Friday afternoon. Dr. J. S. Hurlburt, of Springfield, presided.

Various reports of interest to the profession were made and discussed, and a series of resolutions adopted expressive of the sense of the Society of the worth of Dr. N. C. Keep, the first President of the Society, Dr. Edmund Blake, Vice President, and Dr. Enoch C. Rolfe, one of the oldest members, all of whom have died during the past year.

At the session this forenoon a committee, consisting of Drs. George F. Moffatt, J. H. Batchelder, N. W. Hawes, Jr., H. McDougal and J. S. Hurlburt, was appointed to consider what legislative action is necessary to regulate the practice of dentistry in this State. The following gentlemen were elected officers for the ensuing year :

President—Dr. John T. Codman, of Boston.

Vice-Presidents—Dr. D. G. Harrington, of Newton, Dr. A. M. Dudley, of Danvers.

Recording Secretary—Dr. G. F. Grant, of Boston.

Corresponding Secretary—Dr. T. H. Chandler.

Treasurer—Dr. E. Page, of Boston.

Executive Committee—Drs. Thomas Cogswell, J. S. Hurlburt, E. T. Bradbury, T. O. Loveland and A. M. Dudley.

Dr. Hurlburt was selected as the next orator of the Society, and Dr. R. R. Anderson, of Cambridge, as substitute. It was decided to hold the next semi-annual meeting of the Society at Martha's Vineyard.

Dr. Cogswell exhibited an improved dental case, which was greatly admired for its convenience and compactness.

A Method of Increasing the Solubility of Salicylic Acid.

The solubility of salicylic acid is enormously increased by the addition of borax to the water, so that as much as ten parts of the acid can be dissolved in one hundred parts of water, if eight parts of borax be present. This discovery we owe to Dr. H. Bose, assistant in the Surgical Clinic at Berlin, who has contributed a paper of much interest to the *Berliner Klinische Wochenschrift* (No. 28, July 12), to which we are indebted for the following details : The solution should be made by first dissolving the borax with the aid of heat, and then gradually adding the salicylic acid to the boiling fluid. Since commercial sam-

ples of both these drugs are not chemically pure, a small amount separates, and requires to be filtered off on cooling. The filtrate is a clear yellowish or light brown fluid, according to its concentration. The proof that the addition of borax does not convert more than a part of the salicylic acid into salicylate of soda—a salt devoid of antiseptic properties—is easily shown ; for if we dissolve 69 parts of the acid in 100 parts of boiling water, and then add 2.89 parts of bicarbonate of soda, the carbonic acid in the latter is set free, while the soda combines with the salicylic acid, and on cooling there is such an abundant deposition of the excessive acid that the whole liquid becomes nearly solid, owing to the formation of crystals. Now, if the whole be reheated until the acid is completely dissolved, and then 3.58 parts of boracic acid added, no deposit of any kind occurs on cooling. The most suitable strength in which the above solution can be used for direct application to wounds is, according to Dr. Bose's experience, one which contains from $2\frac{1}{2}$ to 5 per cent. of salicylic acid, and 2 to 4 per cent. of borax. Solutions containing more than 5 per cent. of acid are too irritating, and give rise to a very abundant capillary hemorrhage if applied to the surface of a fresh wound.

Insects that decline to be Eaten by Carnivorous Plants.

It appears that there are insects which defy the traps of carnivorous plants. They venture boldly into the very jaws of the enemy, and eat instead of being eaten. In a recent number of the *Transactions of the Academy of Science of St. Louis*, Mr. Charles Riley describes the curious habits of two insects which are found alive in the pitchers of *Sarracenia variolaris*. The first is a small moth, *Xanthoptera semicrocea*, which lays its eggs within the pitcher. The young caterpillars there weave a gossamer-like web and feed on the cellular tissue of the leaf. The second

is a dipterous insect, *Sarcophaga sarra*
cenia. The mature fly is stated to drop a
number of the larvæ into the pitcher, where
they feed on the decaying remains of other
insects, and finally burrow through the
bottom of the pitcher into the ground, where
they undergo their transformations.

A Scotch Dentist.

A scene, partaking partly of the nature
of tragedy and partly of comedy, was
enacted in a dentist's shop in Greenock the
other day, the principal actors being the
dentist, a slater, and the slater's son. The
slater, whose name is Hay, has a son who
has for some time suffered severely from
toothache, and a few days ago father and
son entered the shop of Mr. Fraser, dentist,
in order that the boy might have the of-
fending tooth extracted. The tooth was
very much decayed, and broke when grasp-
ed by the forceps. On introducing another
instrument, the boy in turn grasped the
dentist's fingers with his teeth and yelled.
The dentist requested him to let go, but
the boy held fast and roared more lustily
than before, and then the boy's father, not
comprehending very clearly the position,
struck Mr. Fraser for ill-using the boy ;
the latter then let go his hold of the doctor's
fingers. The slater was arrested for as-
sault, and fined 7s 6d.—*Dundee Adver-*
tiser.

Cold-Powder.

We have long been in the habit of
using what we call a *cold-powder*, which
we have found of great value in breaking
up colds when taken in time, and in mod-
ifying their force when taken late.

The prescription is as follows :

Camphor, five parts. Dissolve in ether
to the consistence of cream. Then add
carbonate of ammonia, four parts ; opium-
powder, one part.

Mix and keep in a tightly-corked bottle.
The dose is of course regulated by the
opium, and ranges between three and ten
or fifteen grains. We have been accus-
tomed to prescribe it for our friends by
the finger-nail full, or as much as one can
put on the finger-nail.

This powder may be taken in a little
water just before retiring, by preference,
or at any hour of the day, whenever there
is a suspicion of having caught cold. If
need be, a moderate dose may be taken
several days in succession.

The advantages of this powder are very
great.

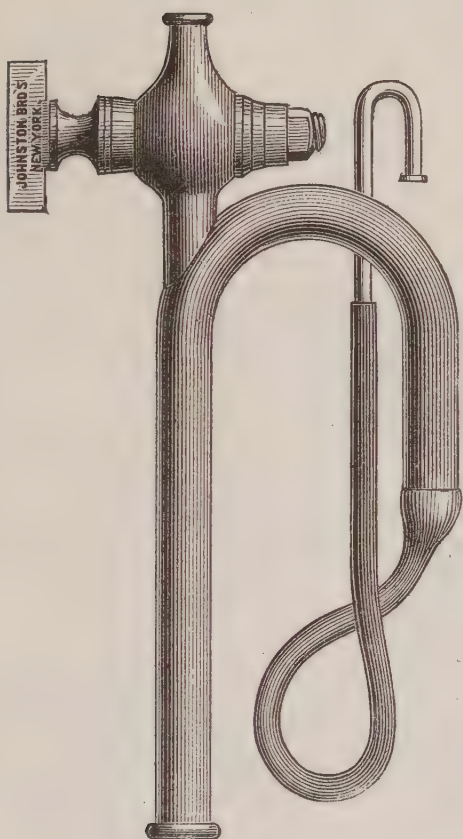
1. The taste is agreeable, or at least is
not disagreeable. Even the bitterness of
the opium is mostly neutralized by the
camphor and ammonia. No child objects
to this powder.

2. It is singularly and inexplicably
efficient. We believe it to be more
efficacious than Dover's powder, and in-
comparably more agreeable. In some
cases it produces a gentle perspiration ; in
others, this special effect is not observed.
It is so easy to take, and so harmless in
small doses, that it is well and safe to
take it whenever we become badly chilled.

We first called attention to this *cold-*
powder in "Our Home Physician," the
first edition of which appeared in 1869.
From various sources, lay and medical,
we hear that it accomplishes all that is
here claimed, and we therefore earnestly
recommend it to the profession.

Quite a large proportion of nervous
diseases, as locomotor ataxia, spinal con-
gestion, neuralgia, progressive muscular
atrophy, and so forth, are excited or ag-
gravated by taking cold ; anything, there-
fore, that will lay the axe at the root of
the tree and remove the cause of those
diseases is worthy of our study.—*Archives*
Electrology and Neurology, Nov., 1874.

ELLIOTT'S SALIVA EJECTOR.



PRICE \$5.00.

The accompanying cut, half-size, fairly represents this simple and effective apparatus for freeing the mouth from saliva. It can be used wherever there is a supply of running water. It may be described as a nickel-plated metallic siphon, having a stop-cock so let into the upper part of its long arm—that if the stop-cock is attached to a pipe conveying running water, the water will flow directly through that arm, and be discharged at its lower end, thereby causing “suction” through its short arm and its connections. This short arm is connected by means of a light rubber tube with a glass mouth-piece designed to be placed in the mouth of the patient and receive the saliva. The “suction” is so strong where there is even a moderate head of water, that if the mouth-piece is

placed in a tumbler of water, the tumbler will be completely emptied in a moment.

Three pieces of rubber tube are required with it as ordinarily used.

1st. A short piece between the supply pipe and the stop-cock. This is sent with the Ejector.

2nd. A waste pipe from the bottom of the long arm to wherever it is desired to discharge the water.

If the Ejector is to be attached to one of the faucets of an ordinary wash-basin, the waste-pipe may be very short, or dispensed with altogether. Price 25 cents per foot.

3d. From the short arm to the dental chair, this tube, as furnished with the Ejector, is four feet long. If a longer tube is needed it can be supplied at 20 cents per foot, on order.

JOHNSTON BROS.,

812 Broadway, New York.

THE MORRISON DENTAL CHAIR.



**Price \$150.00, or, with Castors, \$160.00. Boxing, \$5.00.
Spittoon Attachment, \$8.00.**

It possesses great superiority over any chair before offered to the profession, and is at the same time less expensive than any other first-class chair. Some of its points of superiority we here enumerate :

- 1st. All the advantages of any low-based chair, and also of any high-based chair, are here secured in a single chair. In it the patient can be placed lower than in the lowest-based chair made, or higher than in any other of which we have knowledge. At its lowest position the seat is fifteen inches, and at its highest position forty-two inches above the floor.
- 2d. The operator using the Morrison Chair can either stand or sit at his work, as he may choose, working with equal convenience in either position.
- 3d. It has been a very general complaint that dental chairs are too wide at the back, so holding the operator away from his work. Here this difficulty is overcome. The chair is narrow at the back, so that the operator need not stretch to reach the patient, but *can lower either arm of the chair out of the way* and so be as near the patient as he may choose.
- 4th. It can be changed from its lowest to its highest position in seven seconds — a celerity impossible in any chair raised by a screw.

- 5th. It can be very readily and perfectly adapted to operations on children of any age
First. Because in it the child can be raised as high as needed for the tallest operator.
Second. It provides a comfortable back and head rest, exactly as for grown persons.
Third. The footstool can be lengthened or shortened, to suit children of any size.
- 6th. The back of the chair can be lengthened or shortened rapidly and at will.
- 7th. The lower part of the back can be thrown forward to support the small of the patient's back.
- 8th. The chair, when adjusted to any position, is firm or steady wherever placed, and this is *especially true of the head-rest.*
- 9th. It occupies less room than any other operating chair.
- 10th. Although the footstool, when at its extreme length, is much longer than any other made, yet a person of ordinary weight can stand on its extremity without tipping the chair.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

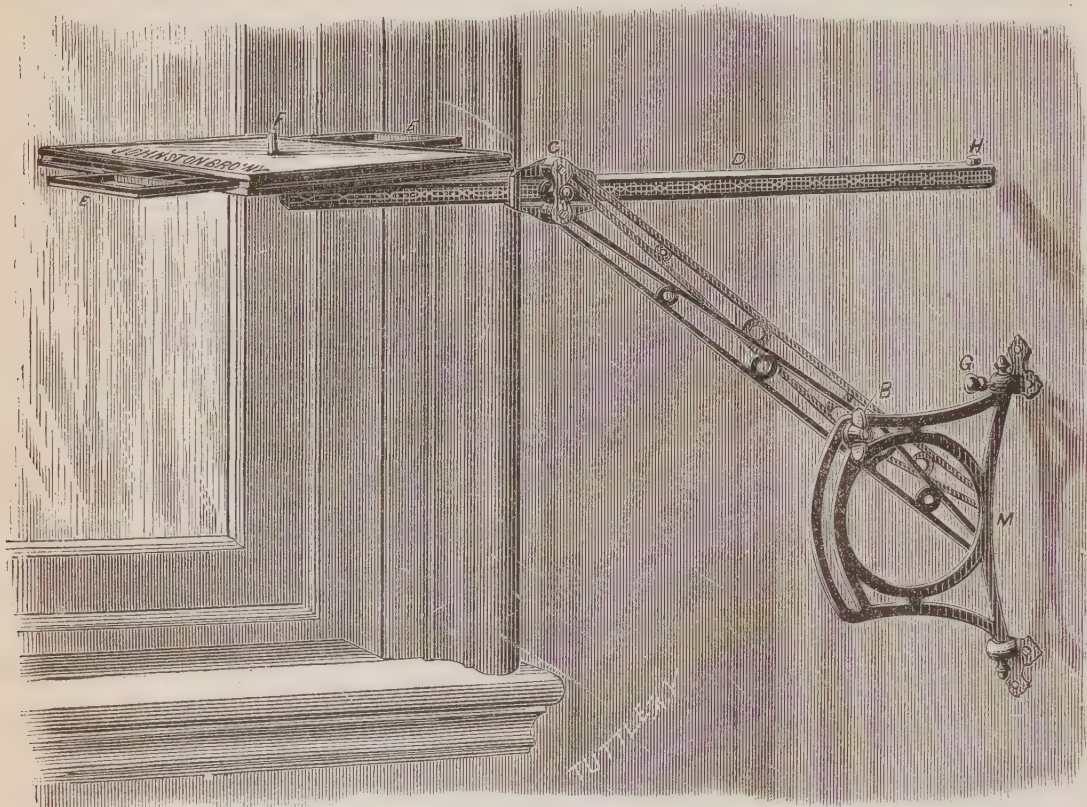
We venture to append the names of some of those who have used the Morrison Chair. As the list of purchasers is too long for publication here, we name a few only from each section of the country.

O. A. JARVIS, *New York.*
D. H. GOODWILLIE, *New York.*
O. A. HOUGHTON, *Brooklyn, N. Y.*
A. C. HAWES, *New York.*
W. B. CHAMBERS, *Newark, O.*
C. B. ANSART, *Oil City, Pa.*
M. H. WEBB, *Lancaster, Pa.*
T. W. FRENCH, *Gt. Barrington, Mass.*
E. H. EVANS, *Rockland, Me.*
E. O. SMITH, *Salem, Oregon.*
W. F. LEWIS, *Winona, Minn.*
T. J. McMILLAIN, *Paris, Ky.*
G. W. TINDALL, *Kansas City, Mo.*
A. W. KINGSLEY, *Elizabeth, N. J.*
J. N. SCRANTON, *Bennington, Vt.*
O. A. GLIDDEN, *New York.*

JAMES MCMANUS, *Hartford, Conn.*
R. F. BORDEN, *Red Bank, N. J.*
F. A. SHAILER, *Essex, Conn.*
WILLIAM DUTCH, *San Francisco, Cal.*
R. B. DONALDSON, *Washington, D. C.*
B. F. COY, *Baltimore, Md.*
C. P. CLIFFORD, *Lowell, Mass.*
S. H. HINKEL, *Stannton, Va.*
E. G. WHEELER, *Mobile, Ala.*
J. A. DAVIS, *Chicago, Ill.*
C. B. ERICHSON, *New Britain, Conn.*
H. BENTLEY, *West Meriden, Conn.*
H. H. SAYLES, *Elmira, N. Y.*
PRESTON DAY, *Warren, R. I.*
E. T. DARBY, *Philadelphia, Pa.*
G. W. TRIPP, *Auburn, N. Y.*

H. B. SANDS, M.D., Surgeon, *New York*

MORRISON DENTAL BRACKET.



PRICES.

With Black Walnut Table, 12 inches square.....	\$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather.....	40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket.....	17.00.
Boxing.....	\$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

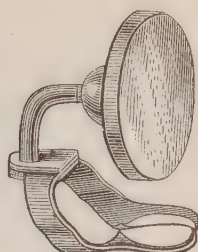
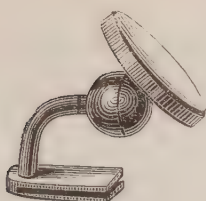
At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

- 1st. It combines a greater variety of range and movement than any other.
- 2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
- 3d. It provides a clean receptacle for foil and instruments.
- 4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
- 5th. Its drawers extend through the table and can be opened from either side.
- 6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,

REFLECTORS.



PATENTED FEB. 16th, 1875.

This reflector is designed to concentrate a strong light upon the cavity. It is so constructed that it can be readily attached to any rubber dam clamp, and by means of a ball joint the mirror can be adjusted to throw light upon any point in the mouth. The operator will readily perceive the great advantage to be derived from this invention in operations upon posterior cavities in molars. The mirror being held in position by the clamp (as shown in one of the cuts), the hands of the operator are entirely free. It is thought that two sizes will meet all requirements.

PRICES.

No. 1, diameter $\frac{1}{2}$ in.....	\$2.75
No. 2, “ $\frac{5}{8}$ in.	2.75

Set 5.50

JOHNSTON BROTHERS,
812 Broadway, N. Y.

THE MONTHLY REVIEW OF DENTAL SURGERY.

Published on the 15th of the Month.

EDITED BY OAKLEY — COLES.

The Review contains, each month :—

Original Communications by Leading Members of the Profession.
Editorial Notices of Current Events and New Inventions at Home and Abroad.
Translations from the Foreign Journals of Articles of Interest to Dental Surgeons.

Reports of Societies. Reviews and Notices of Books and Periodicals.
Critical Abstracts from Current Dental Literature, Correspondence and Records of all Topics of Interest to the Dental Practitioner.

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Annual Subscription, Four Dollars, payable in advance.

Agent for Advertisements,

GEORGE BUTCHER,

4 Crane Court, Fleet Street,
London, England.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

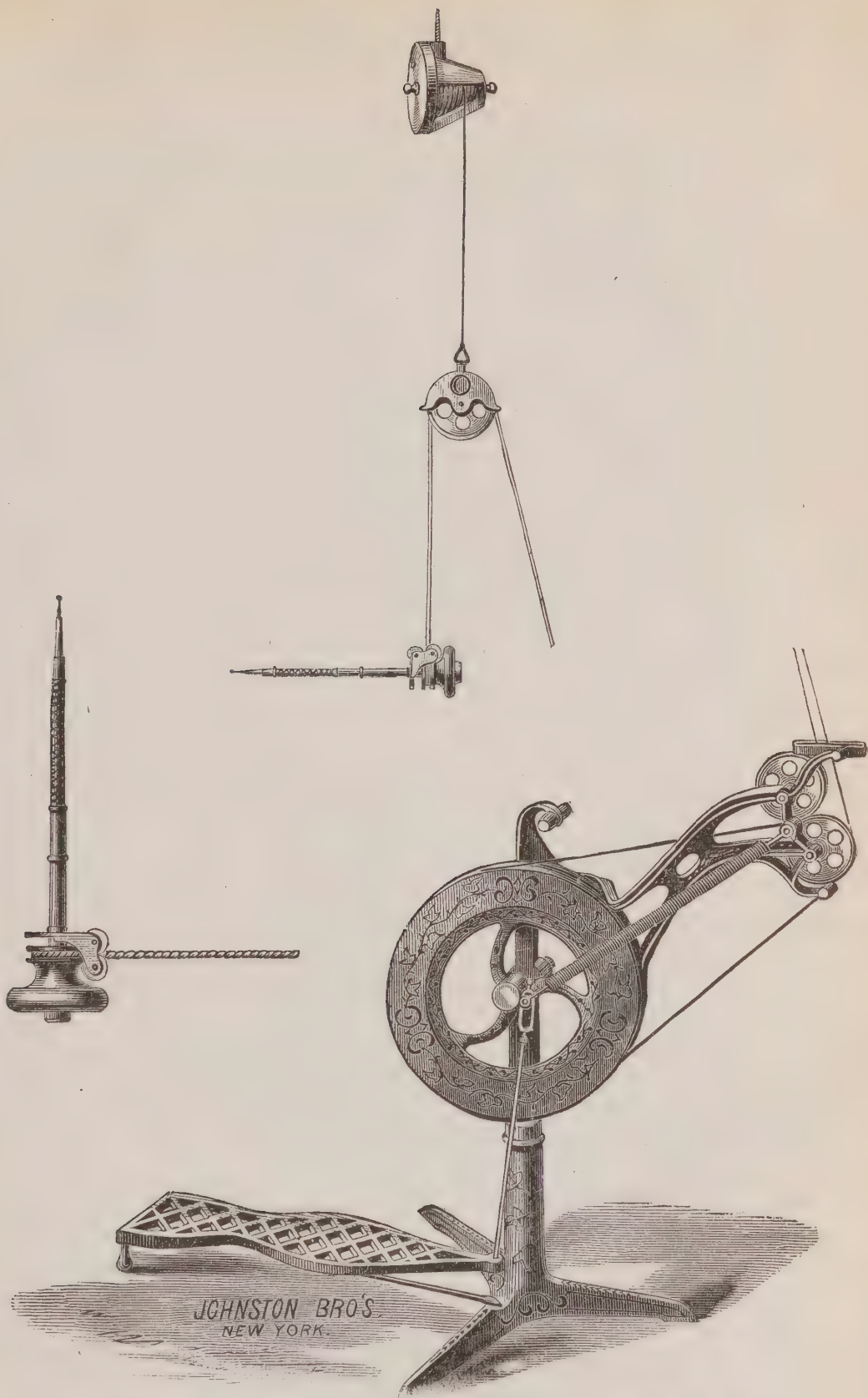
In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or "chattering" which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

- 1st. It is more steady in its movement than any Engine made.
- 2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.
- 3d. It has an abundance of power.
- 4th. It is not easily broken or likely to need repairs.
- 5th. It is, above all others, a "*light running*" Engine.
- 6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROTHERS, 812 Broadway, N. Y.



JOHNSTON BROS.
NEW YORK.

SUSPENSION DENTAL ENGINE.

(DR. ELLIOTT'S INVENTION.)

Price, \$50.00. Right Angle Attachment, \$5.00. Boxing, \$1.00.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($\text{NO}^2 + 2\text{O} = \text{NO}^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid Nitrous Oxide*, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether.....	I death to 23,204 administrations.
Chloroform.....	I " 2,723 "
Mixed Chloroform and Ether.....	I " 5,588 "
Bi-chloride of Methylene.....	I " 7,000 "
NITROUS OXIDE.....	no Deaths in 75,000 "

Edward R. Squibb, M.D., than whom our country has no more able pharmacist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

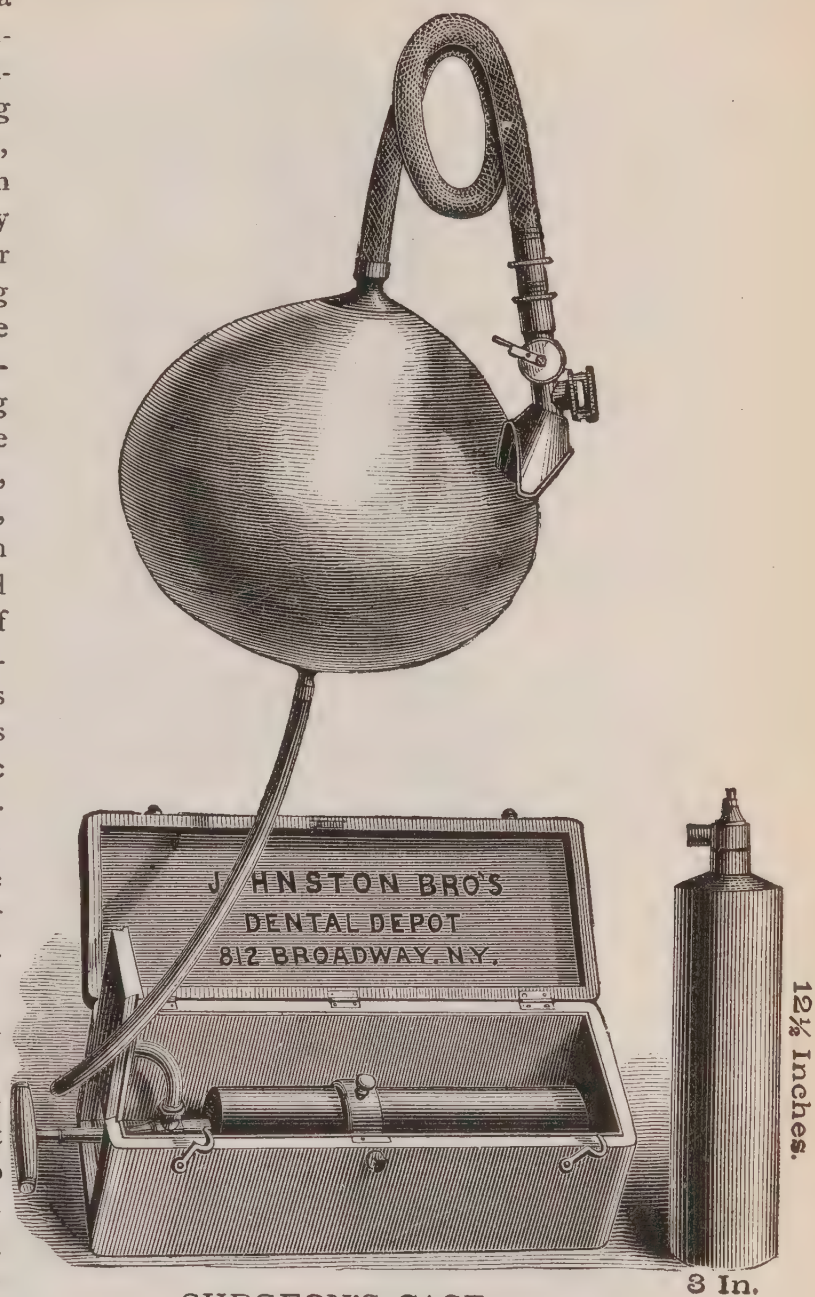
Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

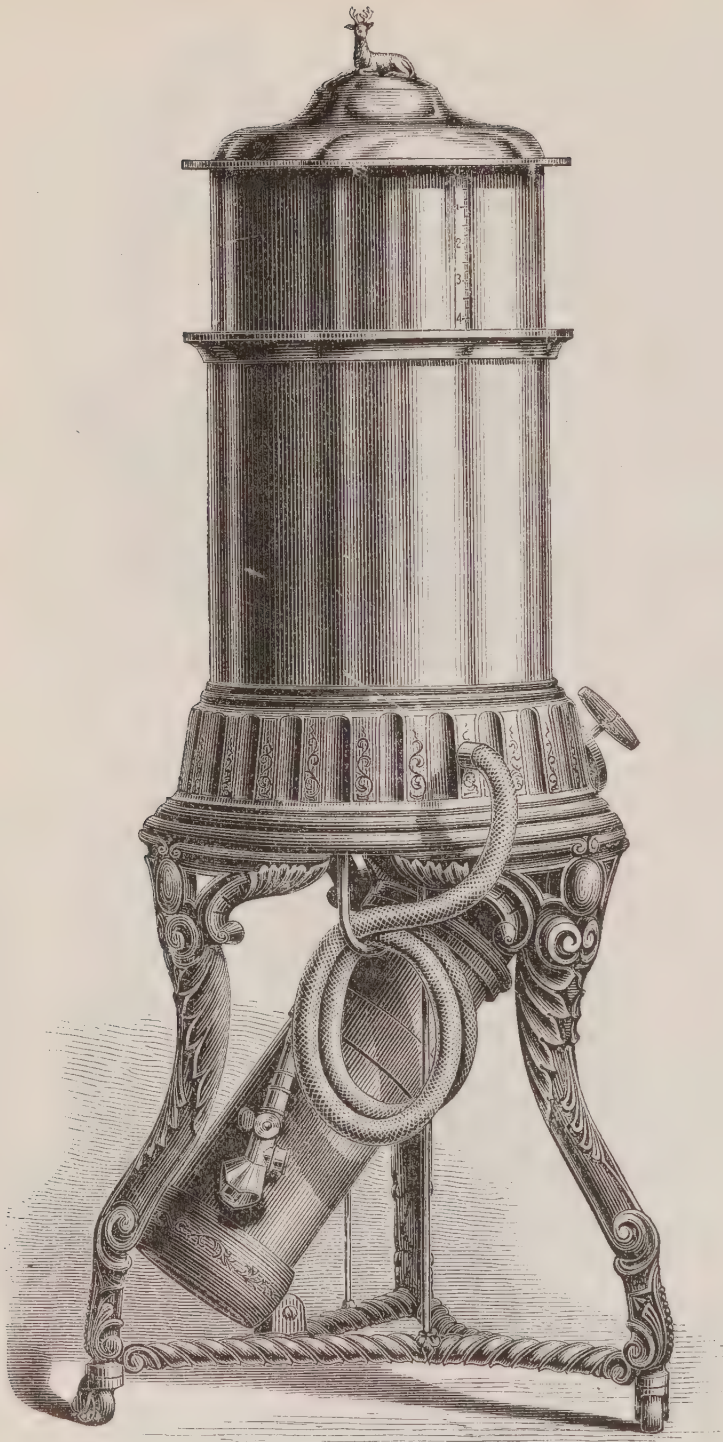
Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers

without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.



**NICKEL-PLATED GASOMETER
AND ORNAMENTED STAND
FOR LIQUID NITROUS OXIDE.**

For Prices,

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas—this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality.*

JOHNSTON BROS., 812 Broadway, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler **No. 1** \$42 00

Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic

Inhaler **No. 2** 45 00

Boxing either, \$1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas 16 00

Refilling Cylinder 6 00

Nickel-Plated Gasometer, with ornamented iron stand 128 00

Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered

Tubing) 12 00

1000 Gallon Cylinder 36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of 4½ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at 4½ cents. 45 00

Morocco covered case, with ring and thumb screw, velvet lined 12 00

Polished bl'k walnut “ “ “ “ “ “ 13 00

Of these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity) 5 00

Rubber Bag, with covered inhaler tubing, extra size 7 00

Inhaler, latest style, with two way stop cock, adapted to the use of both dentists

and surgeons, with connection 9 50

Key, Nickel Plated 1 50

Wrench, “ 50

Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag 1 50

Covered Inhaler Tubing, per foot 50

Plated Connection to fit old style Inhaler 1 00

JOHNSTON BROS.,

812 Broadway, N. Y.

DENTAL FACTOTUM.



Fig. 2.



Fig. 1.

It provides warm water for syringing the mouth.

It provides a warm and dry pocket for mouth mirrors, in which they are warmed without danger of damage, and are always ready for use.

It provides a receptacle in which gutta percha stoppings may be warmed without danger of burning.

It provides a mica annealing lamp.

The cuts represent a handsome nickel-plated piece of office furniture, consisting of a glass alcohol-lamp, secured by a lantern attachment in a metallic case, which protects it from draughts of air. The size of the flame can be regulated through an opening in the case, without disturbing the lamp.

Fig. 1 shows the annealing lamp, having a mica bottomed tray.

In **Fig. 2** the tray has been replaced by a water cup, in which is a hot-air pocket. The mouth mirror—kept warm and *dry* in this pocket—is always ready for use, and will not fog from condensation of moisture on its surface. Mouth mirrors are frequently ruined by being passed through or over the flame of a lamp or by being dipped in hot water, but can be kept at the temperature of boiling water without injury.

A second cup, removable at will, fits in next the mirror pocket, and affords a place for safely heating gutta percha fillings.

Price, complete (with cup, for gutta percha).....\$7.50

JOHNSTON BROS.,

812 Broadway, N. Y.

OS ARTIFICIAL.

We have recently received a fresh invoice of this excellent white filling and are prepared to fill orders for it promptly.

Price, per ounce box.....\$1.00

JOHNSTON BROS.,

812 Broadway, New York.

Liberal Discount to the Trade.

DIAMOND AMALGAM.

Having purchased the *formula* and the *exclusive right to manufacture* the "*Diamond*" Amalgam, we now offer it to the profession and to the trade. It has become too well and favorably known to require extended notice.

PRICES.

Per 1 oz. in box, with pure mercury.....	\$4 00
Per $\frac{1}{2}$ oz. " " " "	2 25
Per oz. in envelope, without mercury.....	3 80
Per $\frac{1}{2}$ oz. " " " "	2 00

JOHNSTON BROS.,

812 Broadway, New York.

Liberal Discount to the Trade.

AMALGAMS

CONSTANTLY IN STOCK.

Diamond, in boxes.....	\$4 00
" in envelopes..	3 80
Lawrence's.....	3 00
Arrington's.....	4 00
Sterling.....	3 00
Star.....	4 00
Townsend's.....	2 00
Extra.....	4 00
Hood & Reynold's.....	5 00
Fletcher's, Gold.....	4 80
Walker's.....	4 00

JOHNSTON BROS.,

812 Broadway, New York.

Liberal Discount to the Trade.

Tooth Powder,
Tooth Powder Bottles,
Tooth Powder Boxes, Wood,
Tooth Powder Boxes, Paper,



**Tooth Powder—Phenol Den-
 tifice.**

1 lb. can. \$1 50
 4 lb. can. 5 00

**Tooth Powder Bottles,
 Filled.**

Size No. 1, containing 2½ oz.
 Odontophile, per doz. \$4 00
 Size No. 2, containing 1½ oz.
 Odontophile, per doz. 3 00

Empty.

FITTED WITH METALLIC TOPS.

Size No. 1, per doz. \$2 00
 Size No. 2, per doz. 1 75
 Odontophile, in Tin Cans,
 per lb. 1 50

Tooth Powder Boxes, Wood.

From thoroughly seasoned wood,
 highly varnished, and labeled.

No. 1, per doz. 40 cts.
 No. 2, " 50 "
 No. 3, " 60 "
 No. 4, " 70 "

A plain box, same shape,
 unvarnished, without la-
 bel, size of No. 3, per doz., 35c.

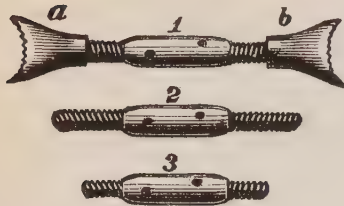
Tooth Powder Boxes, Paper.

Of fancy colored, highly glazed
 paper, without label. Round
 or oval, from 30 to 60 cents
 per dozen.

JOHNSTON BROS.,
812 Broadway, New York.

JACK SCREWS.

Devised by Dr. C. S. LONGSTREET,
with Dr. A. McCOLLOM's Im-
proved Head.



This device is greatly prized by
those who have used it.

PRICES.

Full Set, as above, Nickel Plated,
screw and two extra bars...\$2.50
Jack Screw, Nickel Plated.....1.50
Bars, " " " 50

Improved Triplex Rubber-Dam Punch.

Devised by Dr. F. W. DOLBEARE.
TWO STYLES, Nos. 1 and 2.

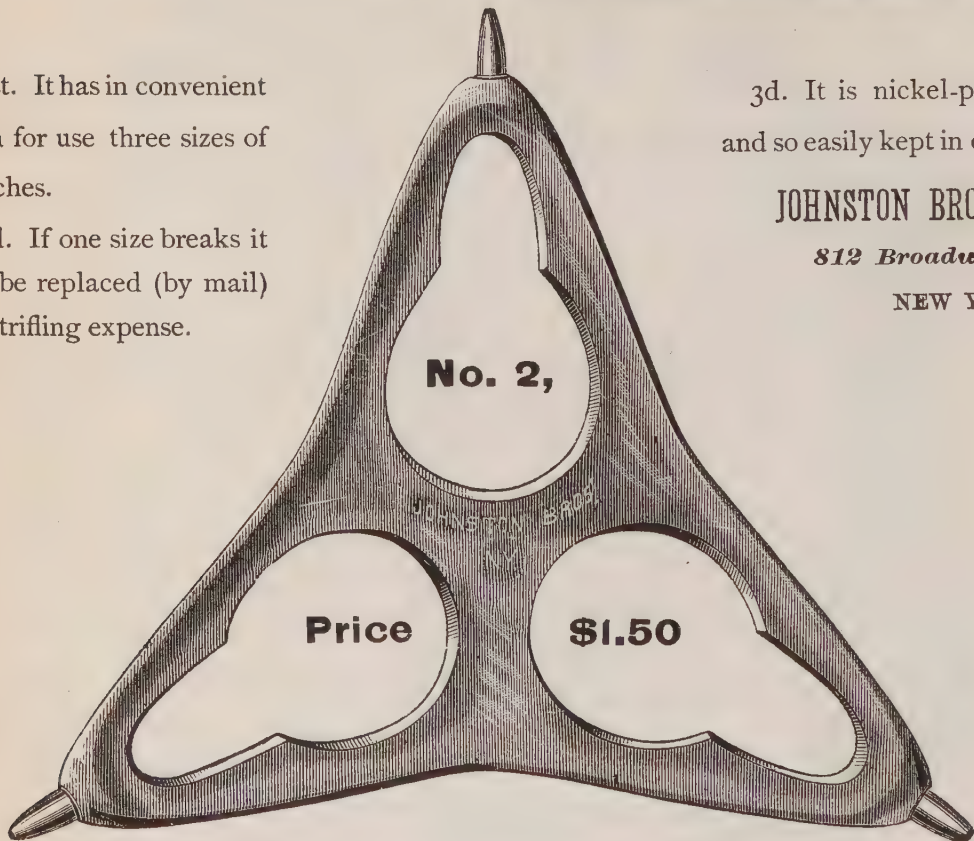


1st. It has in convenient
form for use three sizes of
punches.

2d. If one size breaks it
can be replaced (by mail)
at a trifling expense.

3d. It is nickel-plated,
and so easily kept in order.

JOHNSTON BROS.,
812 Broadway,
NEW YORK.



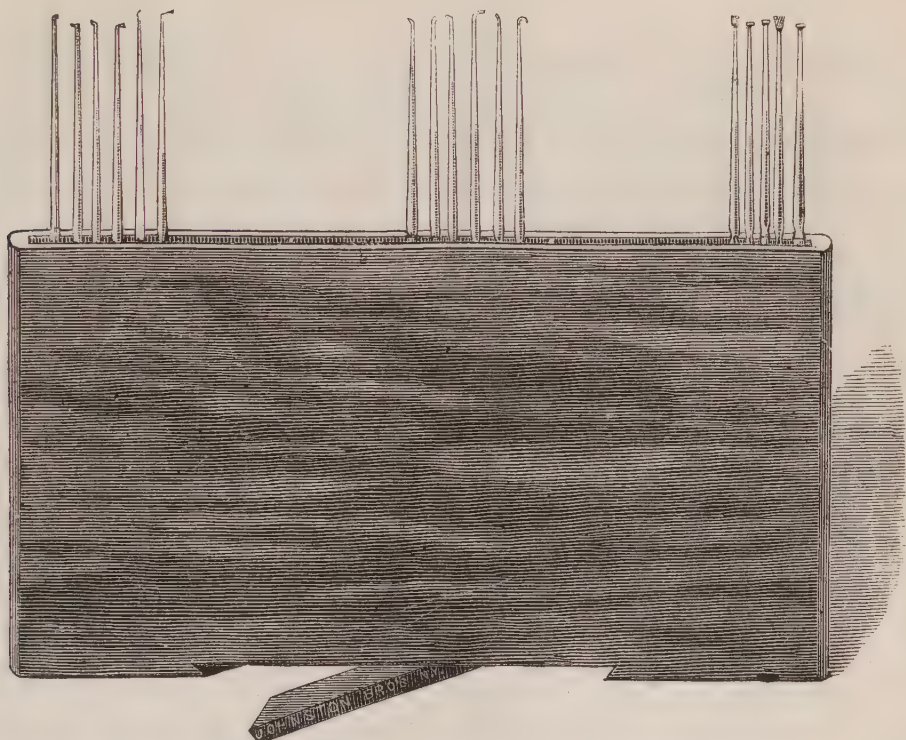
SECOND-HAND CHAIRS.

Dentists who have supplied themselves with the Morrison Chair, frequently request us to sell the chairs previously used by them. We therefore can ordinarily supply, at cheap rates, second-hand chairs of any of the varieties hitherto most used. For particulars, address

JOHNSTON BROS.,

812 Broadway, N. Y.

Fitch's Instrument Stand.



Both time and money are saved by any arrangement by which a dentist's tools are so distributed that he can at a glance recognize, and conveniently lay hold of any desired point.

It is a further convenience, if, when night comes, he may lay them in his drawer secure from dust without disarranging them. Dr. Fitch, of Lee, Mass., has designed an instrument stand for hand tools which combines these advantages. When placed on the table for use it is firm in its upright position, and the point of each instrument in it is distinctly presented to view. When its foot is closed into its base it is but 5-8 of an inch thick, and can be laid flat in any drawer without disturbing the instruments.

We make two sizes—No. 1, for excavating burs, &c., having 3-16 inch handles ; No. 2, for pluggers, &c., having 3-8 inch handles.

Price of each.....\$1.50

JOHNSTON BROTHERS,
812 Broadway, N. Y.

“Premium” Gutta Percha Stopping.

It will not be disputed that a filling which offers the following properties, is sure of a hearty welcome by both dentist and patient.

“Premium” Gutta Percha Stopping,

1st.—Is thoroughly plastic, but not sticky; in this respect an improvement on previously offered Gutta Percha.

2d.—It is very nearly the color of the tooth.

3d.—It adheres tenaciously to the walls of the cavity, and so protects the tooth from decay. Osteoplastic fillings frequently fail, by disintegration around the margins of the cavity, and admit moisture to the seat of previous decay.

4th.—It does not work “salvy,” and by sticking to the *warmed*, (but not *hot*,) instrument by which it is applied, drag itself from the position in which it has just been placed—a common fault with Gutta Percha hitherto.

5th.—It is non-escharotic, and so may be used directly over an exposed nerve, which cannot be safely done with the most used “soft fillings.”

6th.—It is a non-conductor of heat, and hence will not transmit thermal changes, from a cold draft of air, or from hot or cold food to the under-lying nerve. In this it is superior to the best metallic fillings.

7th.—It is readily removable by proper instruments, when used as a temporary filling, more readily than either amalgams or cements.

8th.—It can be used in cavities having frail walls, or where the tooth is sensitive, since very little force is required for packing it.

9th.—It hardens promptly.

Although used ordinarily as a temporary filling, instances are numerous where a Gutta Percha filling has lasted ten or twelve years. We think a variety can be made which will have sufficient hardness to make it fit for permanent fillings.

(OVER.)

Many operators esteem it a great convenience, and often an advantage to the patient, to be able, after having properly prepared a cavity, to leave it a short time, and examine again before inserting the permanent gold filling.

No other material compares with Premium Gutta Percha for this purpose. The tooth is perfectly protected by it, and temporary filling inserted and taken out without pain, and with scarcely any loss of time.

JOHNSTON BROS.,

812 Broadway, N. Y.

We append letters from two well known and highly esteemed practitioners of New York.

44 WEST 46TH ST., NEW YORK, Nov. 10th, 1875.

MESSRS. JOHNSTON BROTHERS:

Dear Sirs:—In reply to the question asked in your letter, I would say I have been using your Improved Gutta Percha Stopping for temporary work the last few days, but have not had time to test the expansion, contraction or durability of it. It is easily manipulated and worked to the margin of the cavity, without any roping or pulling away while finishing. I hope you have been able to imitate the “*Old Bevins*” Stopping. If so, it must be a success.

Very Truly Yours,

A. L. NORTHROP.

NEW YORK, Nov. 5th, 1875.

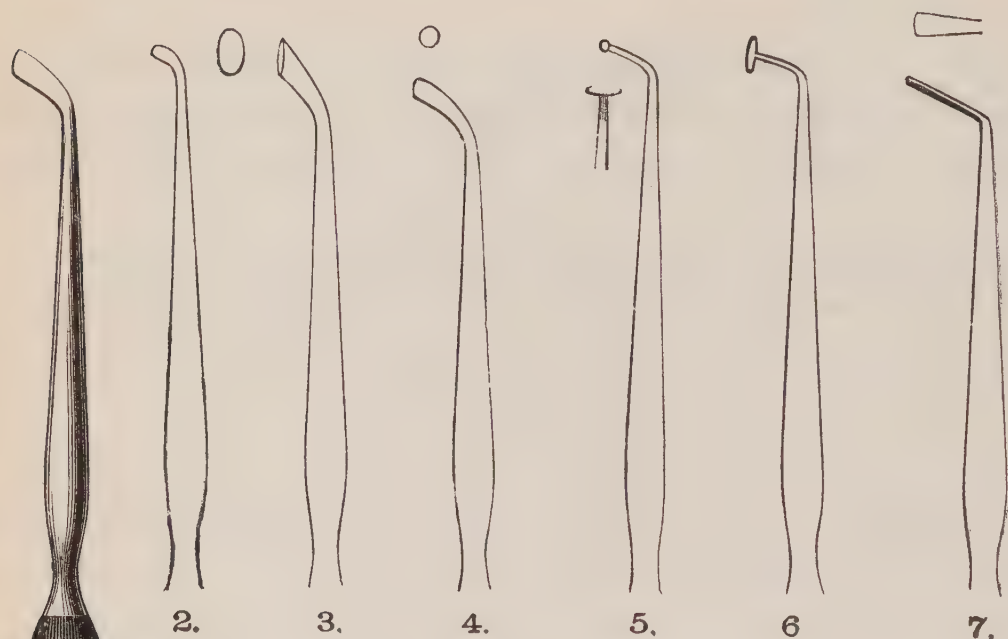
JOHNSTON BROTHERS:

Gentlemen:—In reply to your inquiry as to the qualities of the Gutta Percha you sent me, I think I may safely say that in the somewhat limited time I have had for testing it, I have found it equal to the best, if not the best I have ever used. You will remember that the “*Bevins*” of twelve or fifteen years ago has been the standard of comparison for Gutta Percha stoppings, and to obtain something equal to that in quality and durability has been greatly desired. I hope you have excelled it. The sample I have packs with perfect facility, without being sticky or ropy, and does not draw away from the surface of the cavity. If now it becomes firmer and harder by use, as it promises, the profession will be indebted to you for a most valuable addition to their resources for saving the teeth. Accept my thanks for even a two months opportunity of using an article so much better than any thing I have seen for years before.

Very Truly Yours,

W. A. BRONSON.

DR. W. A. BRONSON'S GUTTA PERCHA INSTRUMENTS.



Heretofore there has been no set of instruments designed especially and exclusively for the manipulation of gutta percha stopping. It is so readily worked that most operators have "got along" with any instrument they might have at hand. As in the case of any other filling material, the work can be much better done by the aid of instruments adapted for it. We are indebted to Dr. W. A. Bronson, of New York, for patterns of the set of instruments illustrated above. We are confident that they will find many warm friends, and will fill a place in every well equipped office. For the great advantages of gutta percha as a stopping, see advertisement of Premium Gutta Percha.

PRICES.

Set.....	\$3 50
Any single instrument.....	50

JOHNSTON BROS.,
812 Broadway, N. Y.



NEW YORK COLLEGE OF DENTISTRY,

1875-76.

FACULTY.

FANEUIL D. WEISSE, M.D., Professor of Regional Anatomy and General Pathology.

FRANK ABBOTT, M.D., Professor of Operative Dentistry and Oral Surgery.

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A. RUST CUYLER, D.D.S., Demonstrator of Mechanical Dentistry.

C. P. KREIZER, M.D., Assistant to the Professor of Chemistry, Materia Medica and Therapeutics.

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Monday, October 4th, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions...	\$150.00
For the Course of Lectures only.....	100.00
Matriculation	5.00
Graduation Fees.....	30.00

Board may be obtained for from \$6 to \$8 per week.

For further information, address

FRANK ABBOTT, M.D., Dean,
78 West Twelfth Street, New York.

HARVARD UNIVERSITY.

Dental Department.

BOSTON, MASS. 1875-76.

FACULTY.

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OLIVER W. HOLMES, M.D., Professor of Anatomy.
HENRY J. BIGELOW, M.D., Professor of Surgery and Clinical Surgery.
THOMAS H. CHANDLER, D.M.D., Professor of Mechanical Dentistry.
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LUTHER D. SHEPARD, D.D.S., Adjunct Professor of Operative Dentistry.
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WILLIAM H. ROLLINS, D.M.D., Instructor in Dental Pathology.
CHARLES A. BRACKETT, D.M.D., Instructor in Dental Therapeutics.
IRA A. SALMON, D.D.S., University Lecturer on Operative Dentistry.
CHARLES B. PORTER, M.D., Demonstrator of Practical Anatomy.
CHARLES WILSON, D.M.D., Demonstrator in Charge.
GEORGE F. GRANT, D.M.D., Demonstrator of Mechanical Dentistry.

The Ninth year of this School begins on the 28th of September and continues till the last Wednesday in June. The distinction of Summer and Winter sessions being hereafter abolished. It will be divided into two equal terms, with a recess of one week at Christmas. The course of instruction will be progressive, extending over two years, the lectures of one year not being repeated in the next.

The regular examinations will be held in the following order, viz.: At the end of the first year, anatomy, including dissection, physiology and general chemistry. A certificate from the demonstrator of anatomy will be required of each student, that he has satisfactorily dissected the three parts of the body.

At the end of the second year, dental pathology, including a knowledge of gestation and diseases of women so far as they affect the mouth and throat, dental materia medica and therapeutics, oral surgery and surgical pathology, operative and mechanical dentistry. The examinations in operative and mechanical dentistry will include actual operations and the preparation of specimens of mechanical dentistry.

Every candidate must be twenty-one years of age, and of good moral character; he must give evidence of having studied medicine or dentistry three full years; he must have spent at least one continuous year at this school, have presented a satisfactory thesis and have passed all the required examinations.

The University Degree, D.M.D. (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfil the requirements.

Students may be admitted to advanced standing upon passing a satisfactory examination in a majority of the studies already pursued by the class; but no student shall advance with his class or be admitted to advance standing until he has passed such examination.

The work in the operative and mechanical infirmaries will go on throughout the course, but no student shall be permitted to operate at the chair until he has by observation and practice on extracted teeth satisfied the Professor of his fitness.

The faculty recommend young men who propose to take the degree to spend the whole of the required term of three years of study in the school. But those who wish to spend but two of the three years in the school are earnestly advised to pass their first year of study, before entering, under the direction of a *competent* private instructor.

Unsurpassed facilities for operative and mechanical practice are furnished by the infirmary of the Massachusetts General Hospital which is open throughout the year.

F E E S.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is \$200; for the second year, \$150; for any subsequent year, \$50.

For further information address,

THOS. H. CHANDLER, Dean,

222 Tremont Street, Boston, Mass.

PHILADELPHIA DENTAL COLLEGE,

Nos. 108 and 110 N. Tenth Street, above Arch.

FOURTEENTH ANNUAL SESSION, '76-'77.



FACULTY.

J. H. McQUILLEN, M.D., D.D.S., Professor of Physiology.
HARRISON ALLEN, M.D., Professor of Anatomy and Surgery.
D. D. SMITH, D.D.S., Professor of Mechanical Dentistry and Metallurgy.
S. B. HOWELL, M.D., Professor of Chemistry and Materia Medica.
T. C. STELLWAGEN, M.D., D.D.S., Prof. of Dental Pathology and Op. Dentistry.
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ALONZO BOICE, D.D.S., Demonstrator of Mechanical Dentistry.
J. FRANKLIN WARDWELL, Assistant Demonstrator.

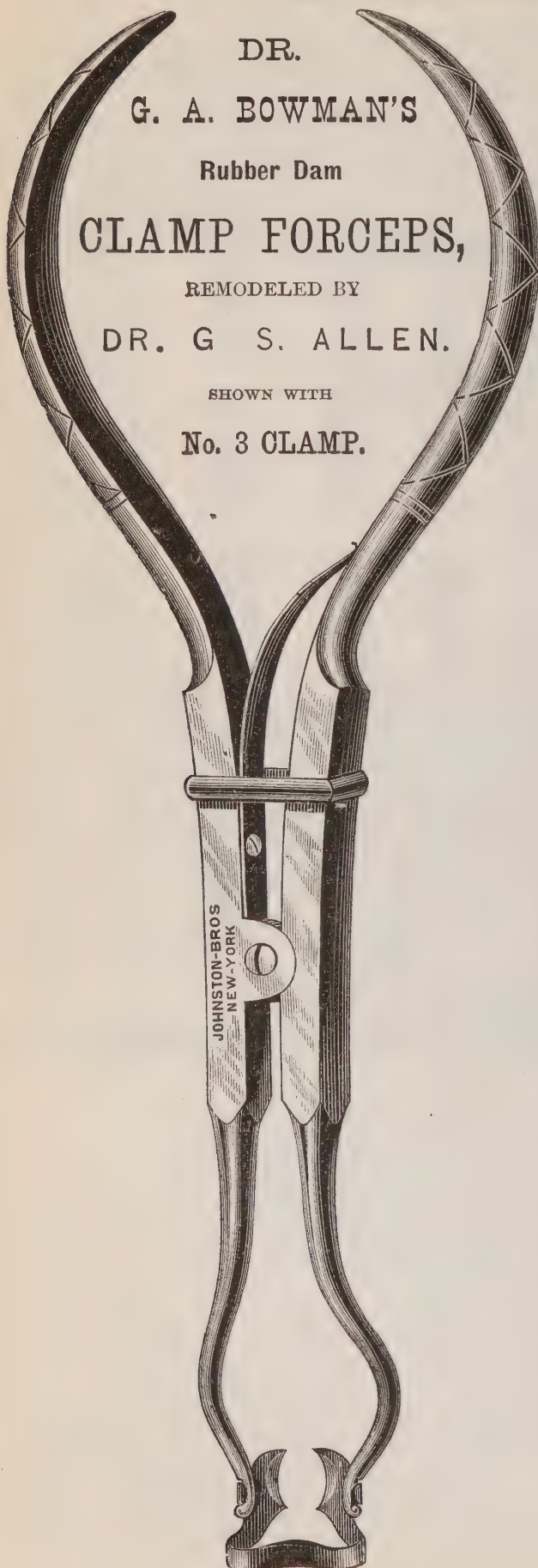
THE DISPENSARY and Laboratory open all the year.

Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June. *Fall Preliminary Lectures*, commencing Monday, September 4th, will continue daily until November. Like the Spring Course, their object will be to anticipate subjects presented during the Winter Session. *The Regular Winter Course* commences Monday, November 6th, and closes on the last day of February ensuing. Three hours of each day will be devoted to attendance upon lectures, which will be illustrated to the fullest extent by a large and valuable collection of Chemical and Philosophical apparatus, and Anatomical and Pathological specimens. Tickets for the Course, including the Demonstrators', \$100; Diploma, \$30; Matriculation (paid but once), \$5. For further particulars address

J. H. McQUILLEN, Dean, S. W. Cor. 21st and Arch Sts.

RUBBER DAM CLAMP FORCEPS.

Of these we offer two styles, both deservedly popular.



POINTS OF DR. T. C. ROYCE'S Rubber Dam Clamp Forceps,

Shown with Clamp. Handles are exactly like the other style, (Bowman's.)

Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

If so ordered we can supply either style of Forceps with a band, which will keep the Forceps and Clamp extended and ready for use when the hand of the operator is removed, as shown on the Bowman Forceps.

PRICES.

Forceps, either style	\$3.00
“ “ “ Nickel Plated....	3.50
Complete set of Clamps, embracing eight forms.....	4.00
Complete set of Clamps, embracing eight forms, plated.....	4.80
Clamps, each.....	50
“ plated.....	60

JOHNSTON BROS.

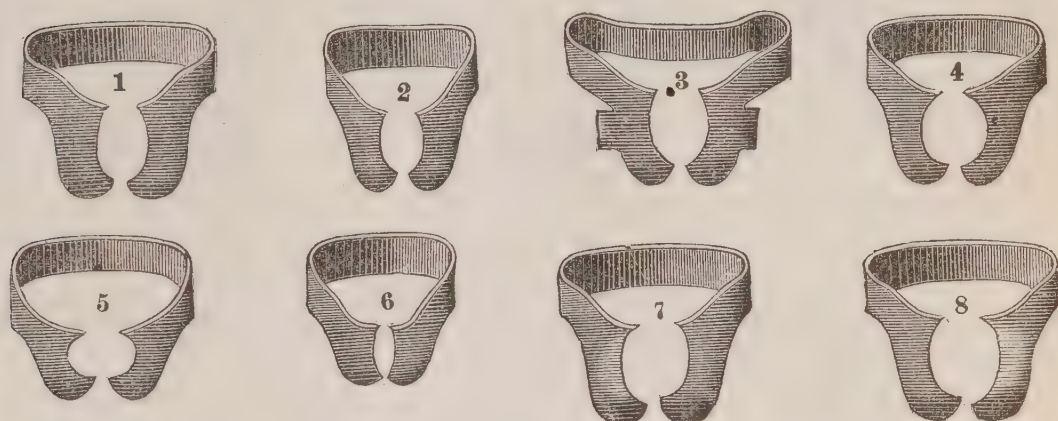
We were never more sure of doing signal service to the
Dental Profession than now in offering the

IMPROVED

Rubber Dam Clamps,

INVENTION OF

DR. DELOS PALMER, OF NEW YORK.



Price, set of Eight, { Oil finish, \$4.00. Each plain, 50 Cents
 { Nickel plated, 4.80. " Nickeled, 60

For use with Rubber Dam Clamp Forceps.

These Clamps are designed to be placed on the tooth at the commencement of the operation. Afterwards apply the Rubber Dam by passing it over both tooth and clamp.

DESCRIPTION.

Nos. 1 and 2.—Universal Clamp for Molars.

No. 3.—For posterior cavities in molars standing alone.

No. 4.—For third molars, or any molar of a cone shape. This Clamp can oftentimes be turned around while on the tooth, so as to place the bow of the Clamp out of the way of the operator.

No. 5.—For bicuspid.

No. 6.—For lateral and central incisors.

Nos. 7 and 8.—RIGHTS AND LEFTS.—For cavities under the gum, on the buccal or lingual surface of molars.

Cuts of two favorite styles of Rubber Dam Clamp Forceps will be found on another page.

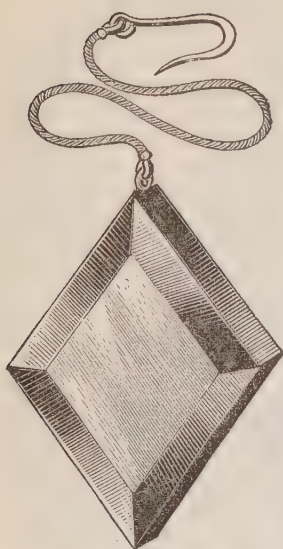
These Clamps have prominent points of marked superiority over those of other manufacturers.

First. Each has been carefully adapted to the shape of the tooth for which it is designed, *under the personal supervision of Dr. Delos Palmer*, the inventor.

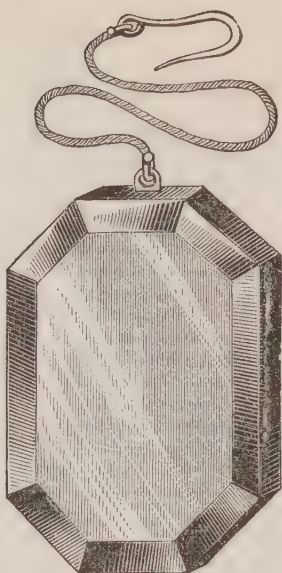
Second. A groove is made by us in the clamp, into which the forceps nicely fit, so that the clamps firmly hold their position on the forceps, when once adjusted, instead of tilting from one position to another—as is the case when no groove is provided.

JOHNSTON BROS.

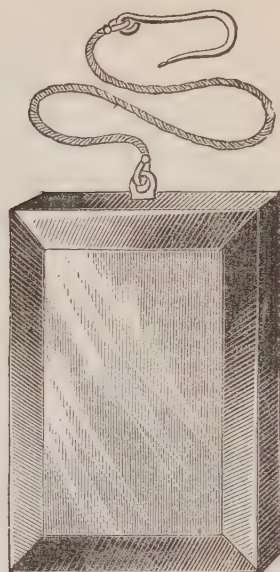
RUBBER DAM WEIGHTS.



No. 1.— $1\frac{1}{4}$ Oz.



No. 2.— $2\frac{1}{4}$ Oz.



No. 3.— $2\frac{1}{2}$ Oz.

These are made of metal, and are nickel plated. They are a decided convenience to one using rubber dam—as by attaching them to the free edges of the rubber, these edges are kept out of the way of the operator and from annoying the patient.

Price, single.....40 cents ; per set, \$1.00.

JOHNSTON BROS.,
812 Broadway, N. Y.

RUBBER DAM.

Invention of Dr. S. C. BARNUM.

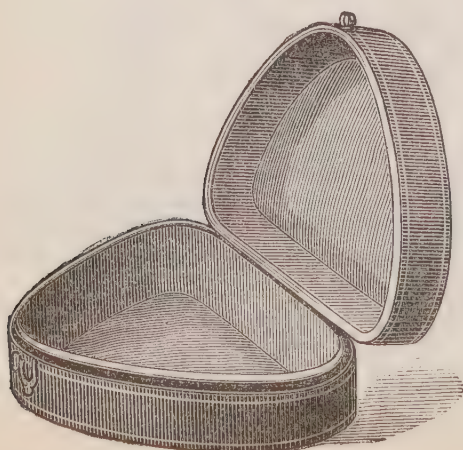
We constantly keep in stock an excellent quality of this article, now a necessity in Dental practice. This we offer in large or small quantity.

PRICES :—Thin, per yard.....\$2.50.
Medium, per yard,..... 3.00.
Thick, “ “ 3.50.

A liberal discount to the trade.

JOHNSTON BROTHERS,
812 Broadway, N. Y.

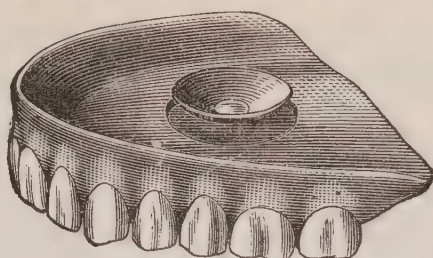
TOOTH CASES.



Morocco, half oval, lined with cotton velvet, each.....\$ 35
Morocco, half oval, lined with cotton velvet, per dozen..... 3 60
Morocco, half oval, brass hinges and silk lined top, each..... 60
Morocco, half oval, brass hinges and silk lined top, each per dozen.... 6 00

JOHNSTON BROS.,
812 Broadway, N. Y.

NEW PATENT ATMOSPHERIC DISK.



FOR HOLDING ARTIFICIAL TEETH FIRMLY IN PLACE

In Eating, Talking, Laughing, Singing, Coughing or Sneezing.

The undersigned offers to the dental profession this new and valuable device for retaining base plates securely in the mouth. Its utility has been demonstrated in over five hundred cases in my own practice. I believe it must come into general use, as no patient will dispense with it after a trial of its advantages. The Patent bears date of January 24, 1871, with seventeen years to run. Office, Town, County, or State rights for sale. Those desiring to test the disks practically before purchasing, can secure the necessary materials, ready for use, for six cases, with full instructions, by sending P. O. Money Order for three dollars.

Office rights for the full term.....	\$40 00
“ “ “ one year	10 00

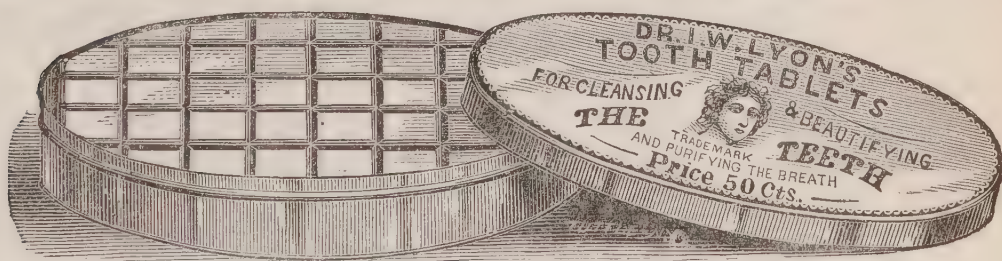
Those purchasing rights for one year will be given rights for the balance of the term for \$30 more, if they choose to continue after the year has expired.

Address

DR. QUINCY A. SCOTT,

Lock Box 1,015, Pittsburgh, Pa.

DR. I. W. LYON'S TOOTH TABLETS.



NOTICE—CHANGE OF BOX.

I have dispensed with the pasteboard box formerly used in putting up the TABLETS, in consequence of its liability to breakage, and have substituted a SEAMLESS METALLIC BOX, which is impervious to air and moisture, and may be carried on a journey without danger of breaking, thereby preserving the TABLETS perfectly.

Confident that the change will be duly appreciated by the patrons of LYON'S TOOTH TABLETS, I am, respectfully,

I. W. LYON, D.D.S., Proprietor,

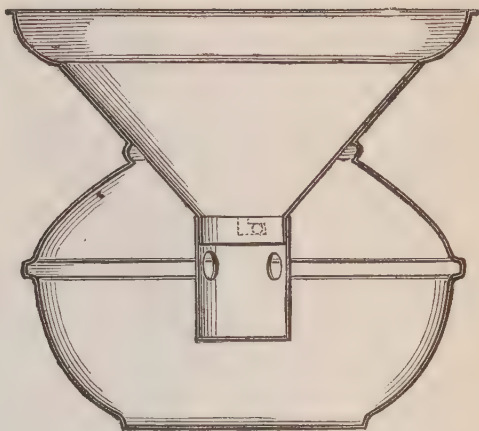
36 Vesey Street, New York.

SOLD BY DRUGGISTS AND DENTISTS GENERALLY, AND AT THE DENTAL DEPOTS.

NICKEL PLATED CUSPADOR WITH GOLD-TRAP.



CUSPADOR.



Section of the cuspador, showing the Funnel with gold-trap attached.

The cuts represent a metallic cuspador, handsomely nickel plated throughout, designed to fit the spittoon attachment of the Morrison Chair. As the funnel can be removed by simply lifting it from the Cuspador, all parts are as readily cleaned as is the porcelain Cuspador now in use. The gold-trap—which is an attachment of the funnel—will, in a short time, effect a saving sufficient to pay for the Cuspador.

PRICES.

Spittoon Bracket, plain.....	not pictured.....	6 00
“ “ “ Nickel Plated— “ “		8 00
Nickel plated Cuspador and Funnel with Gold-Trap..		\$10 00
Funnel and Gold-Trap.....		3 50

JOHNSTON BROS.,
812 Broadway, N. Y.

TOOTH BRUSHES.

A first-rate article.

4 Row Brushes, per dozen.....	\$3 00
5 “ “ “	3 80
Children’s Brushes “	2 30

JOHNSTON RBOS.

Gaylord's Pneumatic Mallet.



The principle on which this mallet is constructed is doubtless *the* one to which we must look for the *perfect* automatic mallet.

The hammer, which is a cylinder of steel weighing about $\frac{1}{8}$ oz., is propelled through an air chamber in the hand piece, by a column of air actuated either by a rubber bulb or an air pump, and as it falls upon the head of the plugger point, gives a blow very closely resembling that of a hand mallet. This blow, in this instrument, is completely under the control of the operator;—he can strike one blow only, or a hundred in rapid succession. He can make it so light that it can barely be felt, or so severe as to be unendurable. This mallet is offered in two forms.

No. 1 consists of a rubber bulb, flattened on one side to rest on the floor, a long air-tight flexible tube, covered with silk externally, and supported internally by a coil of wire, in order to prevent the possibility of a collapse or of kinking, and a finely plated octagonal hand-piece, which is adapted to the Snow & Lewis points, but on order can be changed to take any of the points in ordinary use. Price.....\$22.50.

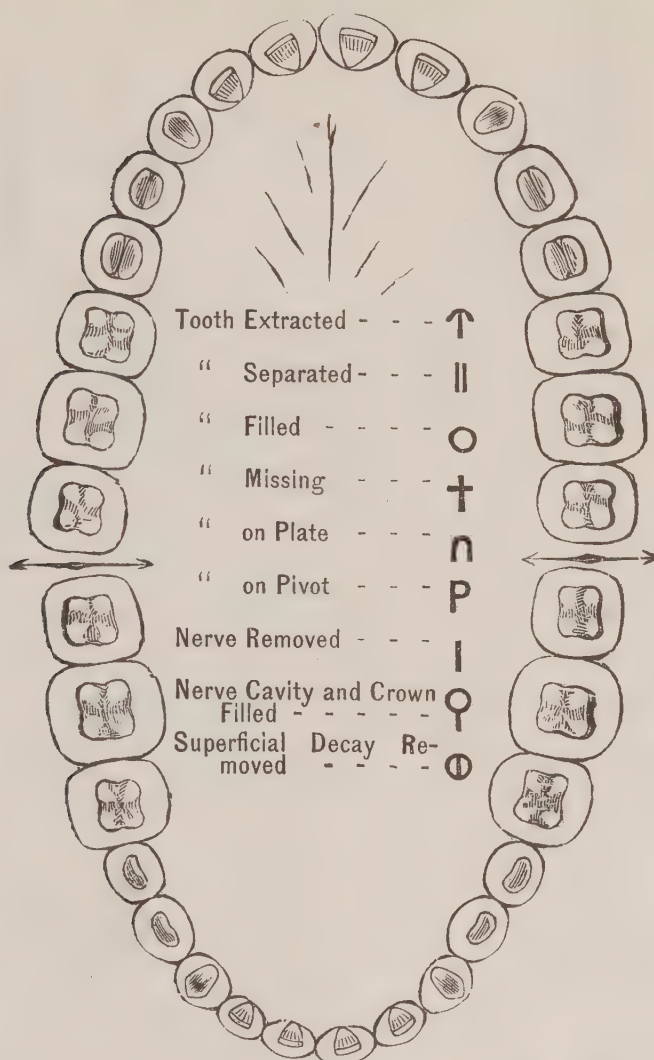
No. 2 is shown in the cut. It has the same construction as No. 1, and in addition an air pump supported by a japanned iron frame, and actuated by a treadle. This is a most convenient form. Price.....\$28.00

No. 3 same, except with power hand-piece to be run by any motor. Price...\$35.00

JOHNSTON BROS.,

812 Broadway, N. Y.

EXAMINATION TABLETS.



These are put up in Pads of 100 Each. Price 50 Cents.

Having this diagram of teeth on one side, and ruled for dollars and cents on the other, they will be found very convenient in making a diagram of any examination of a patient's mouth, or in sending to a parent an approximate estimate of the amount of work needed in a child's mouth.

JOHNSTON BROS.

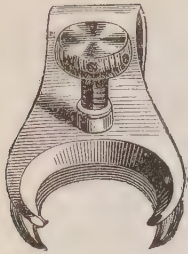
NICKEL-PLATING.

Forceps, Foil Shears, and other Dental Instruments can be kept neat, with little trouble, if thoroughly plated with Nickel. Instruments sent us to be plated will receive immediate attention—be thoroughly plated and promptly returned.

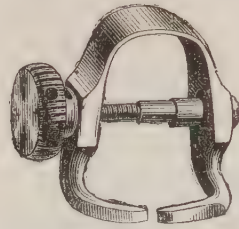
JOHNSTON BROS.

Jarvis' Separators.

(PATENTED SEPT. 8, 1874.)



No. 1.



No. 4.

The cuts above shown are full size, and represent an apparatus for separating teeth. It is almost impossible to overstate the value and convenience of the devices. By their use, without delay to the operator or appreciable pain to the patient, adjacent teeth may be forced apart for any of the various purposes for which it has been customary to wedge teeth. Crowded teeth can be readily parted by using the separators, so that rubber dam can be applied without difficulty or loss of time. Two forms are shown by the cuts; of the first form we make three sizes, **No. 1, No. 2, and No. 3.**

The Separator consists of a piece of steel, nickel-plated, bent upon itself, having the two ends formed to fit the outer portions of the proximate surfaces of two adjoining crowns.

These jaws are forced apart by the action of a screw, which passes through one and against the other of them. This form is applicable to all the bicuspid and molars. It does not touch the gums or injure the teeth, neither does it cause pain sufficient to be of consequence. The whole instrument is drawn to a spring temper. The jaws are thin, in order to be out of the way, and also the more perfectly to adapt themselves to the surfaces of the crowns of the teeth than if they were rigid. The appliance may be left on, in many cases, while operating, or if removed the space gained by its use may be retained by inserting a wooden wedge.

The Compound Wedge, No. 4, consists of two wedges approaching or passing each other. This is especially applicable to the incisor teeth, and will be found particularly useful in making room for passing rubber dam around crowded teeth. In use, a small strip of wood should be placed over the teeth and beneath the cross-bar, to prevent the points from sliding towards the gum.

PRICES.

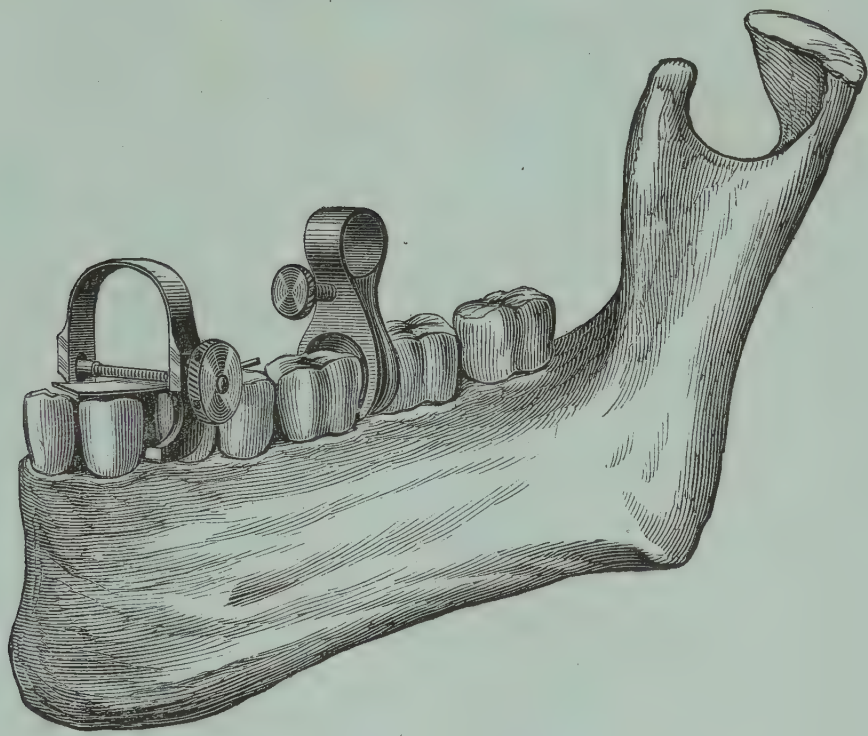
Complete Set of Four	\$6.00
Any Single Instrument.....	2.00

JOHNSTON BROS.,

812 Broadway, N. Y.

Jarvis' Separators in use.

(See Opposite Page.)



WOOD POLISHING POINTS



For Use in Engines.

PRICES.

Box of 100 Points, assorted shapes	\$1 25
Holder, each	30
“ “ Plated	40

Dental Depots supplied at manufacturers' prices.

JOHNSTON BROS.,
812 Broadway, N. Y.

—1876—

JOHNSTONS' Dental Miscellany,

A NEW MONTHLY JOURNAL

OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

ITS CONTRIBUTORS ARE EMINENT WRITERS AND PRACTITIONERS.

It will contain Prize Essays upon the important improvements of the day.

It will contain illustrated articles from DR. NORMAN W. KINGSLEY, on the Treatment of Cleft Palate, Deformities of the Mouth, Regulating of Teeth, &c.

The commendation of the Miscellany received during the last year has gratified its publishers greatly. They purpose to make the volume for 1876 superior in all respects to either volume that has preceded it. This will be—

1st. Through more frequent contributions from the regular writers who have hitherto favored it, and by promised essays from equally capable practitioners, who have not as yet written for its pages.

2d. By the further reproduction of engravings upon dental subjects. Three such have already appeared, and others are in course of preparation.

3d. By the constant search for, and publication of items of office practice, which serve to show the methods adopted by eminent and experienced dentists to overcome the little perplexities of every-day practice, and to shorten the operations in both laboratory and operating room.

In short, it shall be the constant effort of the editor and publishers to make the Dental Miscellany of practical value to every actively employed dentist, as well as a source of literary enjoyment to its scientific readers.

TERMS OF SUBSCRIPTION—IN ADVANCE.

One Copy, one Year, postage prepaid.....	\$2.50
Single Numbers.....	.25

PREMIUM.

One-half ounce of "Premium" Gutta Percha Stopping, . . . value \$2 50

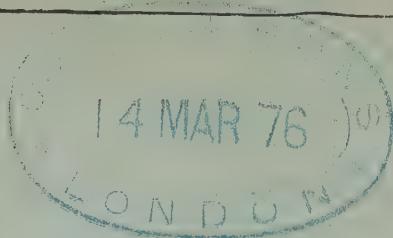
SPECIMEN COPIES SENT FREE.

JOHNSTON BROTHERS, Publishers,

812 BROADWAY, NEW YORK.

VOL. 3.

No. 26.



Johnstons' Dental Miscellany,

A MONTHLY JOURNAL OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

FEBRUARY, 1876.

NEW YORK :
JOHNSTON BROTHERS,
812 BROADWAY.

JOHNSTON'S DENTAL MISCELLANY,

FOR 1875.

It is certainly reasonable cause of self-congratulation on the part of the publishers of this Journal, that the end of the first year of its publication finds it with a large and constantly increasing list of subscribers, and that they are constantly in receipt of letters of encouragement and commendation from their readers in every section of the country, and even from distant portions of the world, one such letter being recently received from Japan.

We are promised one or more articles from each of the following gentlemen of established reputation, and others of like standing in the profession have encouraged the expectation of like favors from them.

Dr. A. L. NORTHROP, New York.
Dr. WM. H. ALLEN, New York.
Dr. J. B. MORRISON, St. Louis.
Dr. W. C. BENNETT, New York.
Dr. A. H. BROCKWAY, New York.
Dr. D. H. GOODWILLIE, New York.
Dr. W. A. BRONSON, New York.
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Dr. E. A. BOGUE, New York.
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Dr. C. BREWSTER, Montreal, Canada.
Dr. C. E. FRANCIS, New York.
Dr. W. JARVIE, Brooklyn.
Dr. E. MAYNARD, New York.
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Dr. NORMAN W. KINGSLEY, N. Y.
Dr. WM. CARR, New York.
Dr. N. W. HAWES, Boston.
Dr. L. C. WASSON, Ottawa, Kansas.
Dr. W. H. DWINELLE, New York.
Dr. A. C. CASTLE, New York.

Dr. T. H. CHANDLER, Boston.

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JOHNSTONS'

Dental Miscellany.

VOL. III.—*FEBRUARY*, 1876.—No. 26.

STORY OF A NOSE.

By NORMAN W. KINGSLEY.

A few years since I was applied to by a young woman, a widow in moderate circumstances, whose portrait is here shown. (Fig. 1.)

She stated that her nose, which was originally of fair proportions, had sunken within a recent period, and was naturally a source of much mortification to her. She had been told by some friends that they knew of like cases, in which the nose had been lifted up and a silver bridge, or support, inserted. With this idea, she had applied to a distinguished professor of surgery for relief, and was by him referred to me. The object of this reference was, that if I would undertake to make and adapt the artificial bridge, the surgeon would insert it. As the responsibility of the future well-being of the patient would be very limited in the part which I was called upon to perform, I made no objection.

My first step was a cast of the face, as shown in Fig. 1. From this plaster cast I cut off the nose, and dissected away at the sides at the base of the nose until I came down to an imaginary bone. The supposed contour of bone I arrived at approximately by a study of the living face—feeling the superincumbent tissues, and also by a comparison with a skull. A bridge was then modeled into such form as the case seemed to require, making due allowance for the nasal tissue which it was to cover. This model was made permanent in black vulcanite and highly polished. Vulcanite was chosen because it would permit of softer, smoother edges than metal, and would be much lighter; and black vulcanite because it was believed to be harmless. This bridge is

shown in Fig. 2. The base, marked A A A, was spread out and flattened like a flange, and adapted to the supposed bone. B. represents the support for the middle of the nose. This bridge being in readiness, the surgical operation proceeded as follows :

Two incisions were made from the mouth through the upper lip, one



FIG. 1.

into each nostril. An incision was also made from each nostril, along, beneath, and behind each wing of the nose, and along up the base of the nose, three-fourths the distance to the eye. Such incisions are indicated in Fig. 1 by a dotted line. The object of the incision through

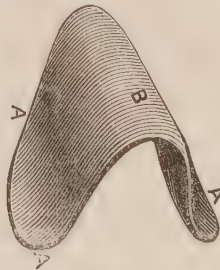


FIG. 2.

the upper lip, was to lengthen the column of the nose, and thus give the nose more prominence. When this dissection was completed, the nose was turned up over the forehead, and the vulcanite bridge applied. The adaptation seemed to be approximately accurate ; the bone was still

covered with considerable soft tissue, and I could not observe that any change in conformation was required. Being left in position, the nose was turned down over it and the sutures inserted. A portion of the extra length of the nasal columna was needed, and the remainder cut off; the upper lip was drawn together, and the operation complete. The nose began immediately to puff up, and before we had retired from the scene it resembled a small-sized potato more than anything else in nature. However, the patient was in good condition, and in a very few weeks the lip was so sound that the scar, which was exactly in the middle, was hardly noticeable. The lip had also lost the rigidity resultant upon the narrowing, and seemed as mobile as ever. The scars, also, at the sides of the nose were scarcely observable. Nevertheless the nose retained its potato-like form.

The retention of the bridge was without discomfort, except as a prolonged soreness was observed at the upper end. This soreness increased until it became evident that the bridge was shifting its position, and twisting around, *i. e.*, the apex of the bridge was swinging over to the right side of the nose, and likely to crop out. No external pressure to restore it seemed to have any effect, and another surgical operation was determined upon to anticipate the appearance of the bridge of its own volition. It was then determined that another bridge should be made with legs to steady it—that is, processes which should pass each side the vomer, and enter the nasal canals.

This bridge was also made of vulcanite, and on a supposed model.

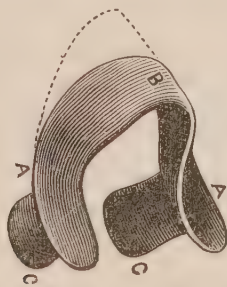


FIG. 3.

It is shown in Fig. 3, and includes the dotted line. The second surgical operation consisted in separating the nose from the upper lip by a horizontal incision, and continuing up the sides on much the former line.

While this was going on, I had some gutta-percha softened in hot water, and immediately on the nose being turned up, and the old bridge taken out, I took an impression of the surface, and of the nasal pas-

sages, to the depth of more than half an inch. I made a plaster cast of these parts, with all the rapidity that I could manipulate plaster, accelerated by the aid of salt, and with equal rapidity of movement the new bridge was softened by warming over an alcohol blaze, and adapted to the plaster cast; the processes marked C C, Fig. 3, entered the nasal passages, and were quite accurately adapted. All this did not take five minutes, and probably the surgical operation was not delayed more than two or three minutes. The surgical operation was completed in the usual manner.

The healing of the wounds went on rapidly; but the presence of the bridge was uncomfortable, and within a few weeks it became evident that the new bridge even with its legs would not remain stationary. It was getting decidedly cross-wise. A third operation was determined upon, and also a third bridge. It was hoped that with an accurate model of the parts as they revealed themselves at the last exposure, that a new bridge could be made so closely fitted that it would be an improvement upon the others; and also as the nose seemed to need support only in the middle, it was deemed best to reduce it in size; therefore, the third bridge was made like Fig. 3, exclusive of the dotted line. The nose was again cut off and turned up, and the second bridge removed. Then came a consultation of surgeons, and a decision that, inasmuch as the nose had been lifted out for, now, considerable time, and some soft tissue had accumulated underneath, it would be unwise to insert another bridge, and consequently the nose was replaced, minus a bridge.

The rest of the tale is soon told. The external wounds were healed in a short time; the nose began to sink to even less than its former position, the nasal passages contracted, and in a little time were completely closed, and respiration, except through the mouth, was absolutely impossible. And the last stage of this patient was worse than the first.

NEW YORK ODONTOLOGICAL SOCIETY.

(Continued.)

Dr. Benj. Lord read the following paper upon "Filling Teeth:"

For a good while to come it will be the chief occupation of the dentist to fill teeth.

The means of preventing decay, and so save the necessity of this much needed operation, are yet to be discovered, or at least, to a large extent, so as to be put in practice. This may be the province of the den-

tist of the future, but it is for us to know how best to perform those operations which will prevent further waste of the teeth that are already defective.

The subject of filling teeth, is well worn, but from the many failures, it is certain that it is not well understood, or at least practiced, by a large majority of those engaged in the profession.

I do not propose to cover all the ground, at this time, not even to the extent that I might, and have only thrown together, hastily, some thoughts that may be suggestive, and lead to discussion.

It has been the fashion of late years, to a great extent, to call in the aid of machinery, in the operation of filling. This I consider detrimental to the best interests of our art, to its highest development.

I know full well, that my views upon this question differ rather widely from those of many of my professional brethren for whom I have the highest respect, and though I may not succeed in convincing any of the correctness of my methods, it is my clear conviction that many of the more recent modes of practice, will, ere long, be very much modified.

It must be evident to every experienced observer that the decay of the teeth is found principally in three localities, viz.: in the ends or grinding surfaces, in the approximal surfaces, and along the margin of the gums, and it is my candid opinion that cavities in either of these localities may be better and more expeditiously prepared and filled, by hand pressure and soft foil, than they can be by the use of the mallet and cohesive gold, and if the whole army of dentists now practicing in the United States had contented themselves with soft foils and hand instruments, there would have been more teeth saved than have been saved by the more modern modes of practice, which are generally adopted.

In the first place, almost all cavities have at least three walls, or walls on three sides.

Now to pack gold into such cavities, one of two courses or principles must be adopted; either that of cohesion, which means beginning at the bottom of the cavity, with an anchorage, and building layer by layer, until the top or surface is reached, using mainly direct pressure, with instruments sufficiently fine to insure that every point in the cavity has the gold packed directly against it, relying upon its cohesive qualities to make a solid, tight stopping; or the principle of wedging must be employed, using soft foil, gold or tin, which allows of the use of larger pieces, thereby greatly expediting the operation; relying

upon placing and packing the foil against the bottom and walls of the cavity, and using the point and side of the plugger to unite and condense the folds or layers, as added.

I use the word condense, rather than the word consolidate; for if the filling is well condensed against all the walls of the cavity, it is not required that it should be absolutely solid, to protect the tooth from further decay, on that surface.

I will here say that I saw a tooth only yesterday—a superior lateral incisor, with quite a large filling on the anterior approximate surface—that was filled in this way and had stood forty years and was still doing well.

In filling teeth upon the plan just alluded to, with soft foils, great care should be observed not to condense, in the progressive steps of introducing the foil, so but that each additional piece or layer may be forced into that which preceded it, that the whole may be as perfectly interwoven as possible.

When we get to the end or last piece of soft foil, we can then use cohesive foil, to very great advantage, by folding a one-half or one-third of a sheet of No. 4, into a strip a quarter of an inch wide, cutting the strip somewhat obliquely, into lengths from a quarter of an inch to an inch each. Then, with a suitable instrument, take a strip at the point, and force it into the last piece of soft gold, which will carry that part of the filling down or sidewise, as the pressure may be directed, securely anchoring the cohesive piece. We may then add cohesive foil on to this, at pleasure, extending the cohesive foil over the whole surface, for harder finish, or to secure with more ease and certainty an oval surface of the approximal fillings, if deemed desirable.

The use of cohesive foil on the surface and over soft foil, I consider particularly desirable in small cavities, and in cavities of only three walls. The cohesive gold, except in cases of building up, should be used without re-annealing, as doing so makes it stiffer, and causes it to work less kindly; of course to re-anneal soft foil would spoil it to use as such.

This I believe to be the most simple, expeditious and certain mode or plan of filling teeth, and one that can be carried out in nearly all cases with entire success, with hand instruments and without the use of the rubber dam.

Whereas the length of time required to put in fillings, on the cohesive plan, almost necessitates the use of the dam in all but the simplest cases, and there is no doubt but that it is often used for cavities so simple that the tooth might be well filled with soft gold and hand instruments in less time than it takes the operator to apply the dam.

Then there is a great temptation and desire also, when the rubber dam is in position, in cases where the teeth are more or less broken away, to build out and restore the natural contour of the teeth, even to bringing the approximal sides together.

This, evidently, is not the best treatment of such cases. The fillings and the teeth look dreadfully labored, and the teeth are not only not self-cleansing, but are left so that they cannot be readily cleansed at all. Then of course the causes that produced decay in the first instance, would have full play again.

To perform such operations, requires a concentration of effort and nervous force that are almost superhuman, and some have no doubt fallen victims to the strain, and hence, humanly speaking, did not reach their highest usefulness here.

Further, I believe that there are as many failures at the cervical wall, when the rubber dam is applied, as when it is not used, as it is not the rubber dam, or even dry work, which accomplishes the object, but the perfection with which the gold or tin is condensed against the walls of the cavity.

This I say from actual observation, and without fear of controversy.

I feel that much more might be said that would bear directly upon this subject, especially in reference to the unnecessary time that is consumed upon fillings, and consequently increased expense to the patients, and also in reference to the greater usefulness of skilled practitioners, when using those means and methods that can be applied the most expeditiously.

Now there can be no question but that there are a few men who can use the more modern appliances, such as the rubber dam, the mallet and the burring engine, and not only do no harm with them, but make most satisfactory operations, both to themselves and their patients; but we are not, as in other departments of life, dealing with the few, but with the many, and it is evident that the great majority cannot use them, nor can they learn to use them, to advantage to themselves or their patients. I do not wish to be understood as discarding these helps altogether, for they are real helps in special cases, but it is the more general and indiscriminate use of them that I wish to condemn, for I firmly believe that, as they are used, particularly in the country towns in the United States and throughout the cities and towns of Europe, they are degrading the art.

The fact that machinery is employed to an almost unlimited extent, in nearly all the mechanic and useful arts, is no reason why we should

bring it into requisition, in cases where the manipulations are so delicate, and upon living tissue.

Our art is too closely allied to the fine arts, proper, to be treated or handled in this way.

The subject of instruments is so intimately connected with that of filling teeth, by any particular plan, that the two cannot be separated ; but I will not take further time of the meeting this evening, more than to say that it is self-evident, that every dentist ought not only to know what kind of instruments he requires for the various operations in and about the mouth, but be able to make them, and instructions to do this should be a part of a regular dental education.

A word more. I believe that if the dental manufacturers, rather than the profession, had not so often decided what the dentists really needed, we would have been better served, and at less expense.

They have not only determined what we should use, but, by their enterprise in various ways, have created a demand and sale for their wares

Dr. A. H. Brockway : There is a great deal in the paper just read that I agree with, and there is also much that I thoroughly disagree with, and these grounds of difference I will endeavor to state briefly. I thoroughly disagree with Dr. Lord's opinion as to the use of engines and the rubber dam. I think that the engine can be used with just as much nicety and delicacy as a hand instrument ; in fact, my experience is that it can be used with more delicacy. I find that I can perform operations with more delicacy by the use of the burring engine than I can with the hand excavator ; and what I claim for myself I have faith to believe others can do. As a matter of economy in time the engine is certainly as great an advantage over the old method as a steam saw is over a hand saw. I rarely use an excavator now, but do all my excavating with burs, and I certainly can do it better and quicker, with less inconvenience and pain to the patient, and with better general results in the shaping of the cavity and the leaving of fine cut edges, etc. The charge is made against the dam that the cavity can be filled while the dam is being adjusted. With that I do not agree. I will undertake to adjust the dam, on an average, in sixty seconds, and once the dam is adjusted, and the cavity dried, there is no further trouble with moisture. It seems to me an immense advantage over the napkin.

Dr. N. W. Kingsley : It is unmistakably plain to my mind that Dr. Brockway's methods of operation and my own are fundamentally different. I am something like the old bachelor who was asked why he had lived to that age without getting married. " Well," he said, " the

fact of the business is, I haven't time to bother with it ;" and so it is in regard to these machines. I have not time to bother with them. I don't assert that Dr. Brockway cannot do what he claims to do by the use of them ; but I am unable to reach such results by their use. In certain cavities which are more or less intricate in their approaches, if I were called upon to operate upon them with machinery I should be entirely baffled, when in the same cases I could take up the excavator and go through with the work in half the time that I should take in changing the burs and getting them into position. I am in sympathy with the essayist in the whole tone of his paper. Dr. Brockway pursues methods of operation so entirely different from my own, that, perhaps for that very reason, I am not properly qualified to pass judgment upon them.

Dr. W. H. Dwinelle : I think we ought to say a few more words in compliment to the author of the paper. I think the whole matter can be summed up in an aphorism, namely : it is not to the instrument that we are to look for the best performance of an operation, no matter what its character, but to the intelligence, the skill, and the experience behind it. As Dr. Kingsley has wisely said, we are differently constituted. I think the wise, celebrated, good and immortal Mrs. Partington one time remarked that she had found in her vast round of experience "there was as much difference in people as there was in folks," and I incline to the same opinion. One gentleman will perform a good operation, and do it in the most admirable manner. Another will take up the same instrument, and do it in the most unskillful and slovenly manner, and yet the last named individual, by his peculiar method, may far excel the first. I agree with Dr. Kingsley, and I endorse and accept the paper read here to-night. I think that its intent is good. It is the results produced that we are to look to. I think if I apprehend the spirit of the paper aright, it is that he is endeavoring to advocate that conservatism which will have a tendency to arrest extremes in practice, and prevent us from attributing to the instrument, and requiring of the instrument that which should be the result of experience and application in the old methods of practice. I think there is a tendency in introducing machinery to make us depend too much on the machine. With all credit to Dr. Brockway as an honest man and a good operator, I think that he is mistaken in his conclusions. I think that relying too much upon machinery causes us to lose our delicacy of touch, which is the last thing that a dentist should part with. He should have as fine and sensitive a control of his instrument as the

painter has of his brush. The instrument should become in a large sense a part of himself, emanating from himself. He should not sink into a mere mechanician.

As to the rubber dam, I should as soon think of finding fault with soft foil as with the rubber dam. Certainly that appliance is all that we can possibly ask for in its way. By its use we can perform our operation with a positiveness and with a certainty to which we could not possibly approach without its use. It makes me nervous when I feel that I am in danger of being submerged. I have no genius in performing submarine operations.

Dr. O. E. Hill : I am very much pleased with the paper, and it seems to me singular that some of the gentlemen present who are so much in favor of all this machinery do not attack it more strenuously. I admire Dr. Brockway, however, in his open and outspoken advocacy of a somewhat unpopular theory of practice ; but for myself I cannot sympathize with his ideas. At one of the clinics held at Dr. S. S. White's dental depot, I saw the dam applied around eight teeth in a case where there was a small cavity to be filled on the anterior approximal surface of the first superior bicuspid. To attach the dam to so many teeth, with the straps and various appliances to hold it in position during the filling of so simple a cavity, is the greatest absurdity that can possibly be conceived of—a cavity any of you here would actually fill in not to exceed ten minutes. In many cases more time is frequently consumed in adjusting the rubber dam than would be required to fill the cavity without it. Dr. Lord is far more right than wrong. I do not believe that in one case in a hundred, where there is a cavity in the grinding surface of the tooth, it is necessary to use the rubber dam or anything but a simple napkin. There are special cases which warrant its use, but in by far the greater part of our practice we can better dispense with it. For myself, I find difficulty in adjusting it, thereby protracting the operation, greatly to the disgust of the patient. If I was operating upon a dead subject I could get along with it, but we must remember that our patients are live human beings.

Dr. F. Abbott : In this talk the mallet has been dropped entirely, but in the essay that we have heard there are as serious objections urged to that article of machinery as to any other. I think as Dr. Hill does, that many mechanical appliances are absurd—for instance, the electric mallet. I cannot do anything with that ; but to say that teeth can be filled better and quicker and nicer by hand pressure than anything in the way of machinery or malleting, to me is simply nonsense ; it cannot be

done. The filling can be inserted in half the time with a mallet, and with better results, than by hand pressure. I find that gold may be packed in a tooth faster, more solidly and firmly against the walls of the cavity with a mallet in some form or other than by hand pressure. I must confess for myself, that of two operations equally good in their results, I choose the easier ; and certainly in performing an operation by hand pressure one is as much prostrated physically in fifteen minutes as he would be in an hour by the use of a mallet. I excavate almost entirely with an engine, and then I go over it with an excavator to see that everything is cut out and shaped as it should be. I usually have my points nicely adjusted, and so placed that I can see every one distinctly, and lose no time in selecting the one I want.

There are a great many young men just commencing with an engine, who do not understand its use, and go further than they ought to with it, cutting in wrong directions, exposing the pulp when there is no necessity for it, and which would not occur if they knew the proper use of the instrument they are working with. They should first learn to perform operations skillfully by hand manipulation, and then they will be able to use an engine accurately and with precision.

Dr. W. H. Atkinson : It is a strange thing to me that we are so positive of the correctness of our own methods of thought and practice, and so prone to suspect the soundness of other people's. There is a substratum of truth, doubtless, in the experience of most operators, that does not come to the surface in their efforts to indicate their understanding of the case, and their methods of meeting the demands of the case. We are apt, in a spirit of egotism, to pronounce as finalities our especially favorite judgment on every subject which is brought before us, and we are somewhat justified in that, for we really are the autocrats of the operation when we have the case in hand. But we are so indefinite and inexact in detailing the steps by which we arrive at a certain result, that we are laid open to criticism thereby, which criticism, if based merely upon deductions drawn from words used, might be unjust to the operator. I have too much confidence in the gentlemen present to-night to think it possible that there is the difference in their practice which there is in their modes of expressing or defining that difference. We all belong to the *genus homo*, we stand in different positions, and see things from different standpoints, but when we come to finalities we have no excuse for any differences. In filling teeth there is, to be sure, a great margin in the facts of nature, and there is a greater margin in our knowledge of the materials we are operating upon, and the exact

relations between tissues at different ages and under different conditions, and the agents we employ in treating them. An operator may pursue a certain course with a tooth of mature age successfully, when the same treatment applied to a young tooth would be hazardous and destructive. The conviction has been forced upon my mind that we lack sadly in a knowledge of the minute anatomy of the teeth—that knowledge that would enable us to determine just how to operate.

Moreover, in order to attain the best results, it is necessary that the machinery or instrument should be in entire subserviency to our understanding and judgment expressed through the will. You say you have learned all the principles of mechanics having to do with your various operations, and that you can prescribe and follow exactly certain limitations as to the directions in which you will cut, but I defy the nicest manipulator to cut as accurately with any instrument not absolutely stiff in the hand, as with an instrument having no spring, or yielding properties; but it is absurd to say that because in a machine there is a mathematical exactness and precision of action, that it does not require, in the use of it, the same manual delicacy as in an operation involving hand-force purely.

It is an utter misapprehension to say there is any difference between them. The good result, as Dr. Dwinelle says, must come from the exercise of skill and intelligence in the operator, directly or indirectly.

It is also absurd to say that you can manage a case as nicely where there are fluid strata, as you can where there is nothing but air. Air is elastic, and can be expelled, but I know of no application of force that will drive all the moisture out of a cavity. The conditions necessary to the saving of a tooth are, first, that you cut down to perfectly sound tissue, and then that you prevent the access of any disintegrating agent. Do that in any way you can. If the unsound condition was produced by the action of an agency from without, keep that agency from getting within, and all I would care to have in the material used is a simple fold of any indestructible material, gold or otherwise, exactly adapted to the walls of the cavity, and then restore the contour of the tooth completely.

Dr. J. B. Rich: The subject this evening has run into methods and results, and facilities for reaching results, and that is about all there is in dentistry. It makes no difference what instruments or appliances the operator uses, provided he reaches good results. There is one point I wish to call attention to—I have been watching this matter for years—viz.: that with the nicest manipulation and with the greatest care

some teeth that we fill with gold we find will fail. We may make as fine operations as we can with soft foil and with cohesive foil, and they are attended by failure. There are a great many good operations that produce poor results, and a great many very slovenly operations save teeth twenty or thirty years. There is something in such cases in the different organisms that we operate upon, and the qualities of teeth that we operate upon, and I think that suggestion was very forcibly brought out in the discussions of the American Dental Association touching the electrical condition of the dentine of the tooth, and the material used to fill the tooth. In the same mouth there is a great difference in the electrical condition between the gold and the dentine. Some teeth are very different in that electrical condition; in the galvanic or electrical action that takes place. I think if we had discrimination enough to know what material would be best to introduce in such cases there would be no difference in the electrical condition, there would be perfect harmony in the condition of the filling and the electrical condition of the tooth structure. I have filled teeth with gold where they have failed, and in apparently exactly similar cases I have filled some where they have remained good fifteen years or more. There is a large field for discussion and improvement in respect to adapting the filling to the chemical and galvanic condition of the teeth.

Dr. E. A. Bogue: I don't want to delay the meeting, but I could not help thinking, as Dr. Dwinelle sat down, how critical we are becoming in expressing our opinions upon each other's operations, and also how retrospective we are becoming in our discussions and investigations. I, for one, am glad to see this antiquarian research. This matter of the rubber dam is tolerably old. As we advance in progress and investigation, machinery is brought in to second our unaided fingers, whether the machinery be simple or complex, and I think that dentistry is as much advanced by the application of machinery as any other calling. This growing perfection in machinery will at an early date enable us to accomplish the mechanical portion of our work with much greater facility, and then, with this obstacle removed, we may look into those deeper and more occult subjects which belong to our profession. I fancy that we are taking up and developing a great many theories which our predecessors did not trouble their heads about. Many of us have seen cavities with fillings, which perhaps were bitten into them, and teeth been thus preserved for many years; but I don't believe that any of us would undertake to put in a filling after that fashion. There are at the bottom of all this matter settled principles, if we could find them out.

There is in the kingdom of nature operative forces which as yet we have not turned to our account. But we, as dentists, are setting ourselves earnestly at work, and our science is being rapidly advanced and promoted. The time is coming when we, as a profession, will devote much more time to the investigation of those laws which fall within our sphere than at present.

I respect Dr. Lord's opinions highly, and am glad he has brought before us such a paper, because I see, every now and then, the evil results of the indiscriminate use of machines which are intended to facilitate our labor. I am glad that this discussion has come up, and I hope that it may provoke our members to a little more inquiry into the foundation of things.

Adjourned.

WM. JARVIE, JR.,

Recording Secretary.

DENTAL JURISPRUDENCE.

By a REPORTER.

Within a few years past, it has become more or less popular to bring suits for alleged malpractice and "unskillful treatment" against the oral and general surgeon. In fact, any specialist, whether a dentist, aurist, gynæcologist, or the physician, are, and have been, frequently annoyed by wicked and malicious suits for alleged malpractice.

These suits are generally brought by ignorant persons. It is rare, I might say almost always true, that a well-educated man cannot be found who would "unskillfully treat" or maltreat a patient, however humble that patient might be.

There seems to be an endemic of these complaints in Brooklyn, New York, at the present time, January, 1876. There have been no less than eight suits placed upon the court calendar within the last four months.

The first suit brought, was for "unskillful treatment" in setting a fractured clavical. The jury did not leave their seats, but brought in a verdict for the defendant. The defendant being one of the many good surgeons of that city.

The second case that came to trial was that of James M. McGarvey vs. W. Irving Thayer, D.D.S. — a suit for five thousand dollars damages.

The complaint alleges "that on or about May 13th, 1875, the

plaintiff called upon Dr. Thayer, to have a second right inferior bicuspid extracted, that said Thayer *broke the jaw* of plaintiff, and that by reason of "unskillful treatment and said fracture, the plaintiff lost part of his jaw and all the back teeth."

The answer was a denial, except admitting the attempt to extract said tooth.

Extracts from Stenographic Minutes of Trial, December 14th, 1875.

CITY COURT OF BROOKLYN.

REYNOLDS, J.

PLAINTIFF'S WITNESSES.

Thos. Baylis, M. D., testified: "I was one of the surgeons of St. Peter's Hospital. I know McGarvey from having seen him there. I saw him first, I think, in June, and afterwards in October. I did not see him when he first came to the hospital; he was then under the care of Dr. Simm's. I heard McGarvey's testimony. I have no recollection of making the remark, that he had a fractured jaw. I do not think I might have made it without recollecting it. When I first saw him the right side of his face was very much swollen, and on that account it was almost impossible to open the jaw far enough to examine. It was afterwards opened inside and pus came from it. It was over where a tooth had been extracted. There have been at various times pieces of bone extracted. I have some here, which were taken from his jaw on the 9th of October."

By the court. When you were able to make an examination, what did you find to be the condition of the jaw?

Answer. "Well, he had a good deal of trouble with the periosteum, and there was necrosis also of the bone."

Question. Had there been a fracture of the jaw?

A. "No sir, I think not."

After explaining the cause and progress of necrosis, the witness added,

"Any mechanical violence might cause it; an attempt to extract a tooth might be an exciting cause under certain circumstances, I suppose."

Cross-Examined: "When I first examined the patient it seemed like an abscess with a good deal of periostitis."

Q. In a tooth with a fang like that (exhibiting a broken root), and in an unbroken circle, is extraction likely to be a more difficult operation than if there had been a broken circle, or the fang had been straight?

A. "I should think it would be more difficult to extract it with that curve, than if it had been straight."

Q. Well, this tooth being a second bicuspid, is it normal to have a straight fang, or a curved one?

A. "A straight one."

Q. Is there any evidence about these pieces [specimens of necrosed bone exhibited] of a fracture?

A. "Not that I can see."

Q. They are all exfoliations, are they not?

A. "They look like it; yes, sir."

Re-direct Examination: "I will swear that I never said his jaw was fractured, or used words to that effect. I never gave him that idea. A jaw might be broken in attempting to draw a tooth. I do not think there was a fracture in this case. I am positive there was not."

William H. Bates, M. D., testified:

Direct Examination: "I am a physician and surgeon; was attached until lately to St. Peter's Hospital. I remember McGarvey's being in the hospital; there were several operations performed on him at which teeth were taken out and pieces of bone, those here shown."

Cross-Examination: Q. What is the cause of that bone being in the condition it is—fracture or necrosis?

A. "I should say it was the result of necrosis."

"The plaintiff asked me in the hospital what I thought about the advisability of bringing a suit for damages against Dr. Thayer. I think he stated to me that Dr. Thayer wished to extract the root and he would not permit it. The fact of a root remaining in the jaw after an attempted extraction would not naturally result in necrosis of the jaw in all cases; it is a sufficient exciting cause in some."

Re-direct Examination: "I do not think a dentist can always tell whether a tooth will draw hard or easy; in a great many instances, I think he can. I do not think that to cut the gum around a tooth would lessen the difficulty of extraction."

Re-cross Examination: "A tooth with a fang like that shown would be a very hard tooth to extract; it would not be remarkable if the tooth being decayed, the crown come off."

DEFENDANT'S WITNESSES.

W. Irving Thayer, D. D. S., testified:

Direct Examination: "I am the defendant; I reside at 24 Schermerhorn Street, in this city; am a graduate in dentistry; have practiced

twenty-two years, am a member of the Brooklyn Dental Society. Am a practitioner in the Homœopathic School of Medicine. Plaintiff came to my office to have a tooth extracted from the middle to the last of April, 1875. I recommended the saving of the tooth; patient would not consent. There was periodontitis when the patient *first* came to me. At the time I took hold of the tooth, the patient slipped down in the chair and the crown came off."

"After the crown was broken off, I told him of the consequences of leaving a root in, and insisted upon his having it out, and made *two several, distinct* attempts to extract that root. After trying twice he refused to have any further operation. I suggested to him to go to Dr. Chapman's to take an anæsthetic (nitrous acid); he objected to that and went away."

"This was the first tooth taken out of that arch; it was the second inferior right bicuspid. Six days, at least, afterwards he returned to me again, and I tried to prevail upon him to have the root out. He would not have it touched at all. The only thing I could do for him then, was to give him constitutional treatment, hoping to prevent this inflammation from extending. I gave him mercurius-vivus of the third trituration, and made a topical application to the gums of the tincture of aconite."

"He went away with a *distinct promise* to come and see me the next morning if his face was no better; and that was the last time I have seen the patient till I saw him in court this morning. When he came to me he was *suffering from periodontitis*; he described his pain as dull, heavy and over the side of his head."

"*Most emphatically, I did not fracture the jaw.*"

Dr. H. G. Mirick, testified:

Direct Examination.—"I am a dentist; have been in practice twenty-five years. I know the defendant, Dr. Thayer; he was associated with me two years. I consider him a very superior operator in every respect."

Dr. A. N. Chapman, testified:

Direct Examination.—"I am a dentist, and have been fifteen years in practice. It is not unfrequent for the crown of a tooth to be broken off in extraction. It is not necessarily evidence of unskillfulness in the operator. I have been acquainted with the defendant four or five years. I consider him a very superior operator."

Wm. H. Atkinsom, M. D., D. D. S., testified:

Direct Examination.—"I am a physician, surgeon, and dentist; graduated in dentistry in 1858, and in medicine in 1847. I am now

an oral surgeon and consulting dentist, practicing at No. 41 East 9th Street, New York."

Explains symptoms and prognosis of periostitis.

Q. What is your opinion as to the *treatment in this case?*

A. "It was correct."

Q. Do you know Dr. Thayer?

A. "I do."

Q. How long have you known him?

A. "I have known him eight years."

Q. What are his capabilities as a surgeon-dentist?

A. "He stands first-class."

Q. You know that of your own knowledge?

A. "I do."

George K. Smith, M. D., testified :

Direct Examination.—"I am a physician and surgeon. I know the plaintiff. I was connected with St. Peter's Hospital when he was an inmate."

Q. Was there any evidence of fracture of the jaw?

A. "I saw no such evidence ; I examined it very carefully at that time and subsequently. I saw some of the pieces of bone that were removed. I cannot say that I saw all ; to me they gave evidence of exfoliation of the bone from necrosis."

EXTRACT OF JUDGE REYNOLDS' CHARGE.

"In this case the plaintiff seems to think (and that is one of the allegations of his complaint) that the defendant, by reason of the want of skill or care, fractured his lower jaw. It has been pretty well established, I think, by the testimony, that there was no fracture of the jaw."

"The defendant, so far as his testimony goes on that subject, contradicts that idea ; but more conclusively and particularly by the testimony of the surgeons who examined the case afterwards, and that of the expert witnesses who have examined the pieces of bone that are produced in court. All concur in saying that there was no fracture of the jaw—that is to say, in the operation of attempting to extract this tooth, the jaw was not broken. But the pieces of bone which afterwards came from his jaw are shown to have exfoliated, as they say, etc., by reason of a disease of the bone called necrosis, which is really the death of the bone ; that is what the word means."

"In this case it may, or may not, be (that is a question I leave to you) that the disease resulted from the presence of the root of this tooth."

“The defendant attempted to extract the tooth, and, doing so, broke off the crown. The fang was left in the jaw, and he attempted to remove that. I think there is no dispute that he made an effort (he, defendant, says he made two distinct efforts) at the time after the crown was broken off, to remove the remainder of it.”

“Here is where comes the principal dispute of fact which I submit to you. The plaintiff says that he requested him to remove it—told him he wanted it taken out, and that he was ready and willing on his part, and requested to have it removed, and that it was not done; and his complaint is now (and the case is left to you upon that theory) that it was the defendant’s fault. Either his unskillfulness or his negligence that he did not remove it.”

“So far as the breaking off the crown of the tooth is concerned, I think the testimony of the professional witnesses shows, and it is undisputed so far as I know, that, “that is a thing which often happens even in skillful hands.”

“I do not think there is anything in this case to show that, in this particular instance, *the defendant was guilty of a want of care*, or that he showed a *want of skill*, so far as that part of the operation is concerned; because it might happen with any one, they all say; and they say that this defendant is a man who is skilled in his profession, *and that he performs his operations well*. Those who *know* him, say that.”

VERDICT FOR DR. THAYER.

REMARKS.—It seems an outrage in our boasted free land that an innocent man can be *pulled* into court to defend himself against such an unjust charge.

A plaintiff who *imagines* he has been injured should be required either to file bonds to indemnify an innocent party, put to such expense, or the law should require a suitable commission, appointed by the court, to examine the case, and see if there is reasonable grounds for action. Said quite an eminent judge, recently, “we have more license than liberty.” Probably the defendant in the above action thinks so, too.

SEPARATING TEETH.

Read by L. C. TAYLOR before Massachusetts Dental Society, Dec. 9, 1875.

The subject of our paper is worthy of as much consideration as any of the practical subjects discussed, and in the opinion of the writer is much neglected. The intermassing of nationalities combined with many violations of nature's law, unite in making up a strange mixture known as human beings. We will not now try to enumerate their many deformities, but will confine our discussion to those of the teeth, which afford ample material for a paper of many pages.

As we see the child only four years of age, with twenty little gems almost pearly white, some of them already attacked by the ravages of disease, what can we say, except to exclaim, Where is the helping hand that will come to the assistance of nature in her time of peril, and aid to ward off the enemy that has already made a firm grasp on the little one! Are there medical remedies equal to the emergency? Can man speak the healing word, and the lost or broken-down tooth substance be restored? The answer comes from every experienced and careful observer, No. Then where are we to find assistance, unless it be mechanical? We are told that filling is the last and only resort when decay has commenced. Very well. We will not detract in the least from the value of good fillings. But how often we find little ones so weak and timid that it is almost impossible to persuade them to submit to the tedious operation of a filling. When we have performed our mission are we not disappointed to see the little patient in a few months with a fistulous opening at the apex of the root, showing that the thermal shock of the metal in contact with the tooth substance was too great for the pulp?

We do not wish to be understood as referring to any class of cavities except those found on the approximal surfaces, which require nine-tenths of the necessary skill to preserve the teeth. We often hear the mother or guardian of the child repeat how faithful they have been in seeing that their teeth have been brushed two and three times per day. But there are many points the brush will not reach, and these are the very points that need assistance. Not when decay has advanced until a filling is necessitated, but when discoloration first commences, and there are signs of breaking down.

If we will adopt the theories of Dr. Arthur, as given in his book, a very large per cent. of the decay in the temporary teeth may be arrested,

and the teeth kept in a healthy condition until nature shall have taken up the roots by absorption, and the crowns are pushed aside by the second dentition. We now find the child is nine years of age, or thereabouts. Have we carefully watched the progress of the incisors as they have made their appearance and taken their position in the jaw? Are they regular and easy, or irregular and crowded? If the former, very good. We have only to see that they are kept clean and healthy, allowing none of the brown coating to accumulate on the labial or approximal surfaces. If allowed on the labial it will induce a vitiated condition of the fluids that will be pernicious to almost every part of the mouth, and especially the approximal surfaces of the teeth.

If we have a darkened or roughened approximal surface, the true way is to free them from the palatal surfaces (thoroughly polishing), leaving a V-shaped opening to enable them to be self-cleansing, instead of allowing them to continue to decay until the necessity for a filling is beyond a question. But in laboring with some good professional brother to induce him to adopt such a course of practice, we may be informed that his patients do not appreciate such operations.

I would answer the above objection by saying that our patients appreciate such operations as they are educated to believe are for their best interest. Show to them the condition of the mouth, with the understanding that effects follow causes, and unless the cause be removed they are soon to suffer the penalty for negligence. I can assure you, you will not be troubled by non-appreciation, but, on the contrary, will be credited by being a benefactor of mankind, with equal, if not greater remuneration.

To return to our subject, we find the incisors are all regular and in good condition. The bicuspid are now making their appearance. Whether they are free and easy, or trying to occupy the position that belongs to some other tooth, should be a matter of careful consideration. Occasionally we are forced to extract the temporary cuspids to allow the incisors to come regular. In such cases we find the bicuspid intruding upon the space that is soon to be demanded by the cuspids. We not only have an irregular position of the teeth, but an unnatural contact, which, if allowed to remain, will be the source of unlimited decay. An irregularity about to exist may be easily forestalled if treated properly. We at once proceed to examine each and every tooth, to see the general condition, and their relation to each other.

We usually find the six year molars with from one to five cavities each, and a general tendency to breaking down, which is only an evi-

dence of the future condition of the bicuspid, if allowed to continue without the assistance of some kind hand, accompanied by good judgment, made so by a careful study of each and every patient that comes to our notice. Finding the six year molars of a poor structure, with satisfactory evidence of the teeth being crowded (possibly not irregular), the extraction of the molars at this time will allow the bicuspid to fall back nearly their diameter, giving room for the cuspid, also leaving the bicuspid free and easy. The next molars will come forward so as to leave but little, if any, space, and the child will have as many teeth as he can accommodate without running a great risk of the loss of the whole.

Should the molars be lost before the time spoken of, it would hasten the eruption of the second molars, which will come so far forward, as even then, in some cases, to leave the teeth crowded. The loss of the six-year molars in some cases is of great value, viewed from other stand-points; but, as we are speaking of the separation of teeth, we will not enumerate them here. The careful observer will notice, after extraction the bicuspid begin to fall back, leaving general ease in the mouth. The texture of the teeth will wonderfully change. Instead of the chalky, whitish appearance, the teeth will assume a more dense texture, like what we expect when the child is more nearly mature, as seen from eighteen to twenty-two years of age. We not only have a better texture of teeth from the space we have gained, but each tooth will be so situated that all parts may be kept clean with perfect ease, which is a vital point to be gained in that class of teeth where there is an inherited tendency to decay.

We are well aware that there are many objections raised to the extraction of the six-year molars, and in some cases justly so. We do not wish to be understood as advocating this course of practice in all cases, for if nothing needs to be done we would be unjustified in doing anything. If the case is not a marked one, and we are in some doubt what course is best to pursue, a careful observation of the relative proportions of the parents may aid in judging how far we may expect nature to aid us. If the father is of a large, osseous structure, and the mother of narrow, sharp features, we can expect but little if we delay for nature's aid. But if the reverse be presented, we have more reason to expect good results from nature's hand.

We must now consider the poor unfortunate who has failed to secure the proper assistance until disease is considerably advanced. A mouth crowded with teeth, and many of them decayed; we are called upon to make the required number of fillings.

The young operator will be more likely to fail than he who has been a careful observer of the results, obtained not only by his own experiences but by those of others, combined with his experience in cutting away certain portions of the teeth without fear of injury. If we cut out the anterior of the cavity and fill from the front or outside, we are pretty sure to have a dash line at the palatal wall very soon.

If we separate with rubber for some days, to gain space sufficient to fill, the operation is unnecessarily painful, and what is worse, the teeth come together again only to allow the same causes to operate that first operated to break down the tooth structure, and in a very short time undermine our best fillings, furnishing us, or some one else, a chance to repeat the same practically worthless operation.

When we look upon the operations of some of our first-class operators, of thirty or forty years, and behold them as good now as when they were first made, ought not we to consider the principle upon which they were made? Some were separated in a ruthless manner, sadly marring the beauty of the teeth every time they were presented to view. But the principle of self-cleanliness was so far complied with that the teeth were preserved as monuments of more skill than some of the operations performed at the present day. But we are still more cheered to see there was another, and more skillful class of operations performed even in those days.

It would be a long step in advance, if our modern operators would adopt the practice of separating from the palatal surface more freely. It would enable them to fill with greater ease, and render the operation far more valuable, by allowing the space to remain, instead of attempting to restore the full contour of the tooth, without disfiguring the anterior, which is a serious objection to those who appreciate an honest operation.

♫ "DEAD TEETH."

By MARSHALL H. WEBB, D.D.S., Lancaster, Pa.

"Dead teeth are apt to give trouble if cleansed too thoroughly at one sitting," said a member of the American Dental Association at the meeting held at Niagara, in August last.* Since statements, such as these, are frequently made, it were well that they be not permitted to pass without examination.

*See DENTAL MISCELLANY for December, 1875, page 470.

Organic life may have ceased, but even then absolute death may not have ensued. The term "dead teeth" may apply, however, where neither tissual or organic life longer exists, but such death very rarely occurs in the dental organs.

After the death of the pulp the dentine and enamel may be considered non-living tissues, but so long as disease has not so affected the cementum as to have destroyed its tissual life, organic life has not wholly ceased to exist ; hence, the tooth cannot be said to be dead.

When organic life ceases, nature seeks to discard the organ, although such a tooth may be tolerated for some time. If it is desirable that such an one should be retained, the decomposed pulp tissue should be carefully and thoroughly removed, and the pulp chamber cleansed and filled as perfectly as possible. Should a particle of the putrescent pulp, or the preparations used to cleanse or disinfect the parts, or mephitic gas, or even the surrounding medium be forced through the apical foramen, irritation of the tissues surrounding the apex of the root will very probably result ; provided no abscess with a fistulous opening has been made, a condition most likely to be associated with the death of the pulp.

Though such cleansing is not likely to "give trouble" in non-vital organs, or in those cases where abscess has resulted in connection with teeth where the cementum is still normal, yet the most careful manipulation is required when the pulp is devitalized and decomposed, and the cementum and surrounding tissues are in a physiological condition.

For in this condition, although irritation, congestion, inflammation and devitalization of the pulp has ensued, the connection between the pulp and the capillaries, with the superior maxillary branch of the *trigemini* has been severed at the apical foramen, and the ruptured vessels closed. If, in such case, the devitalized pulp tissue be removed before decomposition takes place, the pulp chamber and cavity of decay may be at once permanently filled, after the oozing of blood and serum ceases, and the parts have been thoroughly cleansed. The blood corpuscles which may remain about the apex of the root will be taken up and disposed of by the absorbents.

When decomposition of the pulp has taken place it is absolutely necessary to remove very carefully the putrescent pulp. This can as well be done at once. All that is required is to thoroughly remove all the putrescent tissue, and cleanse the pulp chamber, so that not a particle of the purulent matter is forced through the apical foramen. A fine, barbed broach should be carefully passed alongside of the pulp

tissue toward the apical foramen, and then gently turned, so as to catch and remove such tissue, or its disintegrated parts. This should be repeated until none of the particles remain, when a few shreds of cotton should be wound around the broach, to absorb the liquid which may yet be contained within the pulp chamber. This should be repeated until the parts are dry. Cotton, thus placed upon a broach, should then be saturated with salicylic acid dissolved in alcohol, or with alcohol alone, for the purpose of disinfecting and more thoroughly cleansing the pulp chamber. Every endeavor should be made in these cases not to force any decomposed tissue, fluid or gas through the apical foramen.

Where abscess has resulted, and become chronic, treatment is necessary—an escharotic, such as carbolic acid, should be forced into it, and even through the fistula to its opening, so that the surface of the sac may be changed, and nature be enabled to effect a cure. In organs where the tissues surrounding the cementum are in a normal condition such treatment is not indicated nor allowable, for were even a particle of anything to be forced upon these surrounding tissues, then, indeed, is such cleansing “apt to give trouble;” disease is thus induced, and further treatment rendered necessary.

The patient should be instructed to give prompt notice of any manifestation of irritation at the apex of the root, when the temporary filling with which the pulp chamber and cavity of decay should have been filled ought to be removed, that the escape of the gases or irritating particles may be facilitated. A temporary filling should again be inserted, and the same process repeated, until it is found that no further congestion ensues, and that a normal condition has been re-established in and about the pericementum, after which a permanent filling may be inserted.

If abscess is threatened because the disorganized or pus-corpuscles cannot escape through the apical foramen after the removal of the temporary filling, an opening should be made so that this may be brought about. This opening, however, should be so small as to avoid the danger of subsequently forcing gold through it, yet large enough to admit the pus-corpuscles to escape.

Should the purulent matter not escape, the operation suggested by Dr. Garretson should be performed—the apex of the root having been reached by drilling through the alveolar process. If this is not successful, abscess will very probably ensue.

In this event, although the pain will be severe whilst the blood-cor-

puscles accumulate, and, by the absorption of gases degenerate into pus-corpuscles, and discharge through the alveolar process, yet when the pulp chamber has been carefully cleansed, and it and the cavity of decay properly and permanently filled, there should be no further manifestation of abscess.

So long as a putrescent pulp be allowed to remain, from which mephitic gas arises and escapes through the apical foramen, so long will abscess periodically take place, although, after a fistulous opening has been made, it may thereafter be attended with but little pain or discomfort.

That death of the pericementum, and consequent necrosis, may not follow ; abscess thus manifesting itself should be treated as before indicated, when, if the parts are kept cleansed, nature will effect a cure ; provided there be no interference, nutriment be rich and abundant, and systemic and organic function normal.

AMERICAN ACADEMY OF DENTAL SCIENCE.

At the December monthly meeting of the "American Academy of Dental Science," Dr. D. M. Parker, member of the Centennial Board of State Managers, and President of the Academy, in the chair, it was voted unanimously that the Academy shall endeavor to present in some suitable manner the claims of Dentistry, or, more properly, of Oral Science, at the coming "Centennial" at Philadelphia.

A committee of ten was appointed to make the necessary arrangements, and they have held weekly meetings from that time to the present. To this committee have been added as "advisory members," representative men throughout the country.

In order to still further aid the committee in this undertaking, they now request the co-operation of all members of the profession who may be interested in the movement, and would solicit any information pertinent to the subject that any one may have in their power to give. They particularly desire *facts* relative to the *early history* of the profession in this country, as to individual practitioners, and the efforts that have been made at securing a suitable and thorough education in this *specialty of medicine*.

All information bearing upon the above points will be gratefully received by the committee, and may be sent to

GEO. T. MOFFATT, *Secretary of the Committee,*

No. 1 Hotel Boylston, Boston, Mass.

REMARKS ON ONE OF THE CAUSES OF DEATH DURING THE EXTRACTION OF TEETH UNDER CHLOROFORM.

By T. LAUDER BRUNTON, M.D., F.R.S., Assistant-Physician and Lecturer on Materia Medica and Therapeutics at St. Bartholomew's Hospital.

In a clinical lecture delivered by the late Professor Syme, several years ago, he made the somewhat remarkable statement that, notwithstanding his constant use of chloroform for many years, he had never had a death from it occur in his practice. The reasons he gave for this success were two. "First," said he, "we always use good chloroform; and, second, we always give plenty of it." Now, others besides Professor Syme have used good chloroform—have used, indeed, chloroform by the same makers, and altogether undistinguishable from that employed by him; and yet they have had to deplore the occurrence of deaths during its administration. This fact of itself is sufficient to show that the second reason given by Professor Syme for his success is of great importance; and that, in administering chloroform, it is just as necessary to give plenty of it as to use only the best quality. It is, indeed, very extraordinary to see how timidity in the use of chloroform seems to be associated with a more than ordinary fatality; and how the careless—one would say almost reckless—employment of it is frequently unattended with any inconvenience. In Snow's work on *Chloroform*, p. 151, the following passage occurs: "In Guy's Hospital and St. Thomas's, the medical officers had a strong objection to narcotism by inhalation for the first two or three years after the practice was introduced, and chloroform was used much less generally in these institutions than in any other of the hospitals of London; yet it was precisely in these two hospitals that two deaths from chloroform occurred before any such accident had happened in any other hospital in this metropolis." Dr. Snow seems inclined to attribute both of these deaths to the administration of chloroform; but a careful consideration of them may lead us to another conclusion. Before attempting to analyze these cases, however, I wish to recall to the memory of some here an anecdote regarding the introduction of chloroform into the Edinburgh Infirmary, which Mr. Syme was accustomed to relate in his clinical course. One of the surgeons of the Infirmary, I believe the late Professor Miller, had agreed to Sir James Simpson's request to perform, for the first time, an operation under chloroform. Everything had been prepared, and the tray containing the instruments and bottle of chloroform was being conveyed into the operating theatre, when the beare

stumbled and fell, and the whole contents of the bottle were irretrievably lost. There was no time to get more chloroform, and the operation was performed without it. The patient died on the table. Had chloroform been administered, the death would have been put down to the anæsthetic, and not to the operation ; and, in all probability, not another drop would ever have been used.

This case shows us—and it is only one of many—that deaths used to occur from shock during operations before the introduction of chloroform, but they were then put down to their true cause ; whereas, since its introduction, one hears little or nothing of death from shock, and much of death from chloroform. Another circumstance which is well worthy of notice, and which ought to be borne in mind, is the frequency with which the remark occurs in the descriptions of these so-called deaths from chloroform, that a fatal result was all the more extraordinary and unexpected because the quantity of chloroform administered had been exceedingly small. Mr. Syme would have said that, instead of being extraordinary, it was the very thing to expect ; and if, like him, the operators had given plenty of chloroform, their patients would not have died.

And now let us look at the first two cases of death *under* chloroform—I will not say *from* chloroform—in these two London hospitals, where such a dislike to the anæsthetic was felt.

John Shorter, aged 48, a porter, known to Mr. Solly for some time as a very active messenger, of intemperate habits, but apparently in perfect health, was admitted into George's Ward, under Mr. Solly, on the 9th October, 1849, suffering from onychia of the left great toe, which had existed some time. It was determined to remove the nail, the man having decided, before entering the hospital, on taking chloroform. On Wednesday, October 10th, at a quarter before 2 P. M., he began to inhale the chloroform, with one drachm in the inhaler. It had no visible effect for about two minutes ; it then excited him, and the instrument was removed from the mouth, and about ten drops more were added ; he then almost immediately became insensible ; the chloroform was taken away, and the nail removed. He continued insensible ; and, his face becoming dark, the pulse small, quick, but regular, respiration laborious, his neckerchief was removed, and the chest exposed to fresh air from a window near to the bed ; cold water was dashed in his face, the chest rubbed, and ammonia applied to his nose. After struggling for about a minute, he became still, the skin cold, pulse scarcely perceptible, and soon ceased to be felt at the

wrist ; respiration became slow at intervals, but continued a few seconds after the cessation of the pulse.

The subject of the second case was Alexander Scott, aged 34, a police constable, who died in Guy's Hospital in June, 1850, whilst undergoing an operation for the removal of a portion of the right hand. Mr. Cock, the operator, said that he was certain there was no disease about the patient. He described the accident as follows : The ordinary machine was used ; and, as it had not the effect, witness directed that a napkin should be folded into the shape of a cone, which was applied with chloroform. The removal of a portion of the bone occupied one minute and a half ; but, before it was completed, the blood, which was gushing out, suddenly stopped, when witness directed Mr. Lacy to feel the pulse of the deceased, and they found that the deceased had expired.

The sudden stoppage of the hæmorrhage shows that, in this case, as in others, the action of the heart was suddenly arrested. The first attempt to cause insensibility failed in this as in some other cases.

Let us take yet another case, the second one ever recorded of death under chloroform. The patient, a healthy woman, thirty-five years of age, was taking chloroform in order to have several teeth extracted. The following account of what occurred was given by two female friends of hers who were present at the operation. "The respiratory movements appeared to be free ; chest heaving. Whilst inhaling, the face became pale. At the expiration of about one minute, the instruments were applied, and four roots of teeth were extracted. The patient groaned, and manifested what they regarded as evidences of pain, while the teeth were being extracted, although she did not speak, or exhibit any other sign of consciousness. As the last root came out, which was about two minutes from the beginning of the inhalation, the patient's head turned to one side, the arms became slightly rigid, and the body drawn somewhat backwards, with a tendency to slide out of the operating chair. At this instant, Mrs. Pearson states, she placed her finger upon the patient's pulse, observed it was feeble, and immediately ceased to beat. The face, which was previously pale, now became livid, as did also the finger-nails ; and the lower jaw dropped, and the tongue projected a little at one corner of the mouth, and the arms were perfectly relaxed. The females regarded her as being then quite dead."

In two of these cases, death occurred after the inhalation of chloroform had been discontinued ; and in the third, the chloroform seemed to have no bad effects until the operation was begun. In all of them,

the death followed the operation, and must, I think, be attributed to the shock caused by it. But what is shock? and is there more than one kind of it? for the symptoms were not the same in all these cases. In two of them, the heart seemed to stop suddenly; while, in the third, it failed gradually, although it ceased before the movements of breathing; and the death must therefore be attributed rather to arrest of the circulation than of the respiration. The circulation is kept up in the body by the heart constantly pumping the blood out of the veins into the arteries. Whenever the heart stops pumping, or whenever it gets no blood to pump, the circulation will stop. It does not matter how much blood is in the vena cava or right auricle waiting to be sent into the arteries, if the heart be not beating; nor is the case a whit better when a wound in the jugular has drained away all the blood, so that no efforts of the heart, however numerous and however vigorous, can send a drop of blood into the aorta.

It must be recollected that the blood is only useful to the tissues when it is in the arteries, just as water is only available for household purposes while it is in the cistern or supply pipes. Once the water gets into the sewer it is of no more use, unless it can be filtered and again pumped back again into the cistern; and once the blood has got into the veins, it is no more use unless it can be purified by the lungs and pumped back into the aorta, from which it may once again pass to nourish the tissues. The only difference between blood still in the veins and blood which has run out of them into a basin is that when in the basin it cannot get to the heart, and be pumped by it into the arteries, while, so long as it is in the veins, it generally reaches the heart readily. But although it does generally reach the heart easily, it does not always do so. Sometimes it accumulates in the veins of the abdomen, and never reaches the auricle; so that it might just as well be in a basin for any use it is to the heart or body. This was shown by Professor Goltz, of Strasburg, by a remarkable experiment. After exposing the heart of a frog, he noticed that it beat regularly, and at each beat sent a quantity of blood into the aorta, again becoming full of blood in the interval between the pulsations. The frog's heart is partially transparent, so that it is easy to see by its color when it is empty and when it contains blood. He now struck the frog's intestines pretty hard, and found that the heart stopped. The irritation produced by the blow had been conducted up to the medulla oblongata; and being reflected down the vagus nerves to the heart, had stopped it. After a little while the heart seemed to recover, and began to pulsate again.

But there was a very remarkable difference between its appearance now and its appearance before the blow had been given. Instead of becoming filled with blood during each diastole, and assuming a deep red color in consequence, it remained quite pale and empty; and, although it contracted vigorously, the circulation stopped, for the heart had no blood to propel. On looking at the vena cava, Goltz found the cause of this phenomenon. The frog was hanging with its legs downwards, and the vena cava was not full up to the level of the heart. Usually the vena cava and veins of the intestines are kept in a state of semi-contraction or tone by the vaso-motor nerves; but now they had become completely relaxed; so that the blood which usually would have filled them completely up to the heart was not sufficient, and so they were only about half full. On laying the frog in a horizontal position, the blood ran towards the heart. It was thus evident that the blow on the intestines had done something more than stop the heart. It had also stopped the usual action of the vaso-motor centre; so that the veins, instead of remaining in a state of tonic contraction, became widely dilated. And, be it noticed, this dilation of the veins in Goltz's experiments was more permanent than the stoppage of the heart, and continued after the cardiac pulsations had recommenced. But all frogs are not alike; for sometimes a blow on the intestines will stop the heart without having much effect on the veins; and sometimes it will cause the veins to dilate, and will not stop the heart, although very often, as I have already said, it will do both. The same effects seems to follow blows on the abdomen in man and in the frog, but with this difference: in the frog, the heart may stop for some time, and again go on without much injury to the animal; in man, the stoppage of the heart produces death in not many seconds. A good example of this is to be found in Sir Astley Cooper's *Lectures on Surgery*; where he relates that a healthy laborer belonging to the India House was attempting to lift a heavy weight, when another laborer came up and said: "Stand on one side; let an abler man try." At the same time, he gave the former a slight blow on the region of the stomach, when the poor fellow immediately dropped down and expired. On examination of his body, there was not any mark of violence discovered. Here, no doubt, the blow in the abdomen stopped the man's heart, just as it does in the frog, and death occurred before the organ had time to recover from the shock. In another case, described by Professor Fischer, a young man was struck in the abdomen by a carriage-pole, and, after the accident, lay pale and motionless, with a feeble pulse, empty arteries, deep sigh-

ing respirations, and a livid tinge on his hands and lips. In this instance, the heart had either not been stopped at all, or had speedily recovered itself; but the abdominal veins had been so dilated that all the blood in the body could hardly fill them sufficiently to leave a dribble over for the general circulation, although a little did still trickle into the heart so long as the patient remained in the recumbent posture.

We have, then, two forms of shock, according as the injury produces its effect chiefly in the heart or chiefly in the vessels. But it is not merely blows on the abdomen which have the power of producing shock; irritation of other parts can do so likewise; and this seems to be peculiarly the case with regard to bones. Thus Pirogoff records two cases in which death occurred during operations before the introduction of chloroform. In both, the pain and loss of blood during the operation was only a little greater than usual; yet in both, *immediately after* the bone had been sawn through, the face became pale, the eyes staring, the pupils dilated, a peculiar rigidity of the body occurred, and death immediately took place.

The symptoms in these cases of Pirogoff's are almost exactly the same as those of Mr. Cock's case I have already described; but Pirogoff's deaths were put down to the operation, because no chloroform had been given; while the death in Cock's case was ascribed to the anæsthetic, because some chloroform had been administered; although, on account of the operator's unwillingness to give it at all, the quantity was probably very small.

In all three, it is evident that the heart stopped suddenly; and this in itself was sufficient to cause death, though it is highly probable that dilatation of the abdominal vessels also occurred.

In Mr. Solly's case, the dilatation of the abdominal vessels seems to have been the chief cause of death; for the pulse became gradually, though rapidly, weaker and weaker, and then stopped altogether, just as we would expect it to do if the heart suddenly ceased to be supplied with blood.

In the third case I have described, probably the heart was chiefly affected; for just as the fourth stump of a tooth was removed, the pulse was felt to be exceedingly weak, and almost immediately afterwards became imperceptible.

Stoppage of the heart's action, then, being of such importance as a cause of death, we must now inquire how it is produced. The heart is kept pulsating rhythmically by the motor ganglia, which it contains within itself, and will continue to pulsate for some time after its complete

removal from the body. But though it thus shows its power to contract independently of the central nervous system, it is, nevertheless, influenced to a great extent by the nerve centres within the cranium. It would never do to have the heart acting without reference to the wants of the system, and pumping blood vigorously into the arteries when the pressure within them was already too great, or acting slowly and feebly when the limbs were engaged in severe work, and wanted an abundant supply of blood to enable them to perform it. There are, therefore, nerves, some accelerating, and others retarding the heart, which pass to it from the medulla oblongata, and, acting as the spur and reins of a rider do upon his horse, regulates its beats in accordance with the wants of the system. The retarding fibres are contained in the vagus nerve ; and, when this nerve is irritated strongly, the heart will either stop immediately in diastole, or will beat very slowly and more feebly. Nor is it only by direct irritation of the vagus that this result can be attained. Just as irritation of a sensory nerve sets motor nerves in action, and produces various muscular movements by reflex action through the spinal cord, so may irritation of a sensory nerve set the vagus in action and produce stoppage of the heart, by acting reflexly through the medulla oblongata. A good many sensory nerves can do this ; but there is one which possesses the power in an especial degree. The roots of the fifth nerve are anatomically closely connected with those of the vagus ; reflex stoppage of the heart is produced more readily by irritation of the fifth than of any other nerve. In many rabbits, the heart can be instantaneously stopped by irritating the nasal branches of this nerve by a pungent vapor, such as ammonia held before the nose. In every rabbit, or almost every rabbit, indeed, we can stop the heart by a pungent vapor applied to the nose ; but we do not always do it in the reflex manner I have just described. The animal always closes its nostrils to prevent the entrance of the vapor, and keeps them closed so long, that the carbonic acid accumulating in the blood begins to act on the vagus and stop the heart. But this only occurs after the vapor has been held before the nose for some time ; while the reflex stoppage, which I have just mentioned, takes place at once, almost simultaneously with the closure of the nostrils. This reflex stoppage has been shown by Hering and Kratschmer to be due to the irritation being conveyed along the nasal branches of the fifth nerve to the medulla, whence it is reflected along the vagus to the heart, and stops it.

Yet, notwithstanding the stoppage of the heart, the rabbit does not die ; nor is it, indeed, any the worse. Why is this ? Usually, when

the heart is stopped, as, for example, when a ligature is put round the aorta, the blood all runs out of the arteries into the veins ; and then, as I have said, it is useless for nutrition. But there is a nervous arrangement which prevents this when the heart stops, in consequence of an irritation applied to the fifth nerve. This nerve not only contains branches which are connected with the vagus and stop the heart or retard it ; but it also has branches which go to the cerebral hemispheres, and there excite an action which passes down the vaso-motor nerves, causing the auricles to contract, and preventing the blood from running out of the arteries into the veins, except very slowly indeed ; so that, as soon as the irritation stops, the circulation is ready to go on normally. But it is only when the cerebral hemispheres are in good working order that this occurs. When they are removed, or when their function is destroyed by chloroform, morphia, or chloral, irritation of a sensory nerve, such as the fifth, no longer has the same effect ; and it then always, according to Cyon, lessens the pressure of blood in the arteries. As it is the pressure of blood within the arteries which keep up the flow within them, just as it is the pressure of water within the pipes supplying a town which keeps up the supply to the houses, we can readily see that the diminished pressure which occurs on the irritation of a sensory nerve after the cerebral hemispheres have been rendered useless by a small quantity of chloroform is a most serious thing for the animal. But here it is a little chloroform which is a dangerous thing ; and a full dose prevents any risk from this reflex stoppage of the heart. For the small dose acts on the cerebral hemispheres first, and destroys the reflex action, which contracts the vessels, while it leaves the ganglia at the base of the brain and the medulla unaffected, and thus allows the reflex stoppage of the heart to go on as usual. A full dose, on the other hand, affects not only the cerebral hemispheres, but the ganglia and the medulla, and prevents any reflex action whatever on the heart. I have found that, when a full dose of chloroform has been given to a rabbit, one may hold either strong ammonia or glacial acetic acid before the nose, and not the slightest slowness in the beats of the heart can be observed. Sometimes, indeed, it has seemed to beat rather more quickly than before.

Now let us try to apply these observations on the lower animals, and, by them, try to explain the action of chloroform on man, and the danger of employing it in the extraction of teeth, as well as in other slight but painful operations. For it is precisely in these slight but painful operations—extraction of teeth and evulsion of nails—that death most

frequently occurs ; and it is just in them that little chloroform is given, because the administrator thinks : “ Oh, the operation won’t last above a few seconds, and it is no use in giving the patient enough to keep him or her snoring for half an hour.” We know perfectly well that many and many an one has teeth drawn under chloroform without any bad result ; and we have already seen that every rabbit has not the same liability to reflex stoppage of the heart from irritation of its fifth nerve ; but every now and then we meet with a peculiarly sensitive animal, and every now and again we meet with a case of death from the extraction of a tooth under chloroform.

If the nervous system in man be at all like that of the rabbit, the violent irritation of the fifth nerve caused by the extraction of a tooth will tend to stop the heart. But it will also cause contraction of the blood vessels ; and thus extraction of a tooth in the waking state is rarely attended with any serious consequences. But if the reflex action on the blood vessels, which usually occurs in the cerebral hemispheres, be prevented by a small dose of chloroform, just enough, as in the case I have related, to abolish consciousness without preventing reflex action in the ganglia at the base of the brain, and if the heart of the individual be at the same time peculiarly sensitive to the impression made on the fifth nerve, it may be stopped, and the pressure of blood in the arteries may sink so low that it never rises again ; but if, on the other hand, chloroform be given, as Professor Syme recommended, with a free hand, so as to produce total abolition of reflex action, no irritation of the fifth nerve by the extraction of any number of teeth will have any effect ; the heart will pulsate as usual ; and no danger is to be apprehended from this cause.

I do not at all mean to say that the administration of concentrated chloroform-vapor is free from danger—far from it ; but the limits of my paper will not allow me to enter into this subject. All I can attempt to do is to direct attention to the observation of Professor Syme, whose acuteness and accuracy few will question ; and to try to impress it, by showing the probable physiological reason why one ought always to induce perfect anæsthesia before beginning any operation under chloroform. At the same time, I would observe that, just as the circulation, which had ceased in the frog in Goltz’s experiment so long as it hung vertically, went on again when the animal was laid in a horizontal position so that the blood found its way to the heart, so it may go on in man ; and, therefore, the safest position for operations is the recumbent one.

The two rules, then, for preventing death during the extraction of teeth under chloroform, are: put the patient thoroughly over, and lay him in a horizontal position.

GUM CUTTING.

By C. E. BUCKINGHAM, M.D.

Some months ago, among your "Notes and Queries" was a question about cutting gums. A week or two later a correspondent (E. T. W.), gave a very decided answer as to the propriety and usefulness of the operation. For some time before the question was asked in the *Journal* I had been making the same inquiry of physicians whom I met, and I was rather surprised to find among the younger practitioners so many who had never used the gum-lancet, and who could not imagine the case in which it would be necessary.

The let-alone system of treatment is good; in very many cases it is the best; but it is not always the best. The relief afforded by a free incision through the gum in some instances in which there was acute pain, has, under my observation, been more marked than that afforded by any other operation that I ever saw. The tooth, it is true, in the very great majority of cases, finds its way through without difficulty to the child. The first indication to the mother whose child has always been nursed, and never fed, is often the feeling of an incisor against her nipple. In some cases where a proper plan of feeding has been followed, there is as little indication of trouble during dentition. Occasionally when the child is nursed, more frequently when it is fed, and often when it is improperly fed, the little one apparently suffers pain in the mouth, in the head, and in the bowels, whenever a new tooth is about to make its appearance. In another class of badly fed patients there is always loss of appetite at this time, with sleepless nights, nausea, and vomiting. In others, cough comes on which only exists then, and for which auscultation gives no explanation; and the little patient's sufferings are augmented by "hive syrup," squills, and other nauseants which give no relief, and by "Mrs. Winslow's soothing syrup," and other narcotic drugs, which stupefy but do not cure. There is still another class, consisting mainly of improperly fed children, who have convulsions, sometimes slight, it is true, and sometimes fatal. There is no disturbance of the nervous system, so far as I know, which may not exist in the teething child, and none which may not be aggravated

by improper food. Indeed, the time of dentition is the time when by far the greatest number of deaths take place among children, whether the immediate cause be in the head, the chest, or the abdomen.

The first effect of the incision is the relief of local pain by the oozing of blood. This is more particularly the case in those instances in which the gums are dry and hot, and there is no secretion from the mucous follicles nor from the salivary glands. An incision simply through the mucous membrane is followed by blood, and that by saliva in a very short time, giving great temporary relief; but if the lancet is felt to graze the tooth through the whole length of the incision, the relief is more than temporary; the immediate covering of the tooth never unites again, the growth of the tooth and the elasticity of the tissue preventing that process. If the offending tooth be a molar, a crucial incision is better than a longitudinal one. The relief is often so great from gum-cutting that I have seen children who were crying with agony before the operation, look up in my face and laugh through their tears; and I have known a child to come to me, and show by unmistakable signs her remembrance of the benefit received on another occasion, by turning her head over upon my knees, and pointing to the swelling above a cuspid tooth.

The second effect of gum-cutting is the relief of obstinate diarrhoea, obstinate constipation, and of all apparent signs of diseased brain, such as vomiting, stupor, convulsions, enlarged and non-contracting pupil. This relief I have seen more than once during the past year.—*Boston Medical and Surgical Journal*.

COLLODION FILMS FOR EXPERIMENTAL PURPOSES.

M. Gripon, in the *Journal de Physique*, calls attention to the numerous useful properties of films of collodion in physical operations. There are few bodies that are electrified more easily. The films, stretched on wooden or metallic frames, are thin, transparent, and polished like glass; they polarize light. The thickness (as determined in one case by displacement of interference-fringes) was between .008 and .009 of a millimetre. Collodion gives very beautiful coloration when covering a metal. The membranes are as diathermanous as rock salt for luminous heat of a lamp or a candle; they allow .91 of incident heat to pass; but with obscure heat, as from a blackened cube of water, the diathermanous power is diminished, and they are less diathermanous the less the temperature of the source. Polarizing piles are made by

stretching collodion films on zinc frames and piling these up. The heat is thrown on the surface at an angle of $33^{\circ} 30'$. Such piles can be advantageously used instead of the mica piles, in study of radiant heat. Then very delicate vibrating membranes can be made of collodion, and these have various uses in acoustics. The vibrations can be perceived by applying to the vertical membrane a small pendulum consisting of a pith ball suspended by a cocoon fibre.

PRIZE ESSAYS.

We shall, from time to time during this year, name subjects of especial interest to the profession, upon which we shall invite competitive essays, and will at the same time offer a prize to the author of that one of the essays which shall, in the opinion of a competent examining committee, be considered the most excellent of those submitted upon the subject or subjects suggested. In considering the competitive merit of the Essays for the purpose of awarding the prize, we request the committee to consider the following points of excellence, in the order named :

- 1st. Originality of investigation or of thought.
- 2d. Information imparted.
- 3d. Literary excellence.

The conditions of competition for the prizes offered are these :

1st. All Essays are to be signed with a fictitious name, placed in an envelope, and addressed to JOHNSTONS' DENTAL MISCELLANY. With the Essay a *sealed* envelope containing the real name of the writer of the essay should be enclosed, bearing externally the *nom de plume* adopted. This envelope will not be opened by the examining committee unless it bears the *nom de plume* of the writer of the successful Essay. The writers of the other Essays will remain entirely unknown, unless they direct to the contrary.

2d. The essays written at any one competition will not be handed to an examining committee unless, at the end of the time named for that competition, at least six contestants have submitted articles.

3d. The committee may withhold all award, if, in their judgment, none of the articles submitted are of sufficient merit to justify a prize. In this case none of the articles submitted will be published by us.

4th. All essays submitted for competition are the property of the DENTAL MISCELLANY, and will in no case be returned to the writers. They may be published or not, as the editor sees proper ; but the real name of the writer shall not be disclosed except by his authority.

For the first competition we offer a Suspension Engine, complete ; value, \$50.00. Essays may be on either of the following named subjects :

FACIAL NEURALGIA AS CAUSED BY DISEASED TEETH,
OR,
ON EXOSTOSIS.

Essays offered on the above subjects will be delivered to the committee on the first of April next.—ED.

NOTES.

We call especial attention to the Centennial notices from Dr. Geo. T. Moffatt, page 66 of this issue, and from Dr. Jas. H. McQuillen, page 36 of January MISCELLANY.—ED.

Books Received.

Praktische Gespräche, über Zähne und Zahnarzneikunde. Von C. M. Wright, D. D. S., früher Professor der Mechanischen Zahnarzneikunde und Metallurgie im Ohio Dental College, in Cincinnati, Ohio, U. S. A. Für den Verfasser aus dem Englischen übersetzt, von Mrs. John Icely, in Basel.

Dr. C. M. Wright has shown himself an active, progressive and industrious worker during his absence for the United States. He is always in hearty sympathy with dental conventions, colleges and periodicals, and a promoter of every effort to elevate and educate dentally the community in which he resides. We do not doubt that his "hand-buch" will be of eminent service to the German people, for whom he has written, and who at this time are not as earnest in the care of their teeth as are the people of our own country.—ED.

Questions on the Structure and Development of the Human Teeth—for the use of Dental Students. By C. L. Ford, M. D., Prof. of Anatomy and Physiology in the University of Michigan.

We have known Dr. Ford for fifteen years, and know that he has no superior as an instructor in the department in which he labors. We too have carefully observed the system which has obtained

in our medical schools, of imparting knowledge chiefly by lecture, and are confident that it is entirely inadequate to the role assigned to it. The average attendant on the course of medical lectures has not acquired an education that would fit him to enter the freshman class of our literary colleges. Of a class consisting of two hundred and forty-two medical students at one of our medical colleges, not more than six or eight were college graduates—ten or twelve more graduates of an academy—and few of the remainder were capable of correctly composing, writing and punctuating a page of common English.

That minds so little drilled are able to correctly apprehend and appropriate a scientific lecture, so as to make its teachings in any proper sense their own, is improbable in the highest degree. We therefore hold that while the lectures are good, the ordinary method of instruction practiced in our High Schools and Academies, of which questions and answers form the distinguishing feature, is by very much the preferable plan in instructing those who ordinarily present themselves for instruction at our medical and dental schools.

It is with special reference to this need that Dr. Ford has prepared this question book, and we are assured that all dental students, whether they pursue their studies "in an office" or at some college, will derive great benefit from its use, if they

will but obtain it. As it is but a pamphlet, its cost can be but a trifle. It is published by Messrs. Fisk & Douglas, of Ann Arbor, Michigan.—ED.

Iowa State Dental Society.

The next annual meeting of this Society will be held at Burlington, Iowa, commencing the third Tuesday of May—viz., May 15th, 1876.

J. P. WILSON, D.D.S., *Cor. Sec'y.*

At a meeting of the American Microscopical Society, held January 25th at its rooms No. 35 East Tenth Street, the following officers were elected:

J. B. Rich, M.D., President.

Wm. H. Atkinson, M.D., Vice-President.

Mr. C. F. Cox, Secretary.

Prof. T. d'Oremieulx, Treasurer.

Mr. O. G. Mason, Curator.

Meeting of the Alumni of the Baltimore College of Dental Surgery.

The Graduates of the Baltimore College of Dental Surgery are requested to be present at a meeting to be held at the College Building, Baltimore city, on the 8th day of March next, at 12, noon, for the purpose of organizing an Alumni Association. The 36th Annual Commencement will be held on the following Friday.

JOHN W. FARMER, M.D., D.D.S.,
GEO. F. KEENE, D.D.S.

ERRATUM.—Page 26, Jan. number.—For “flanks” read blanks. In the hurry incident to a late issue, the proof-reading was left to the printer, and neither Dr. Perry or the Secretary of the Society corrected the proof.—The context shows so plainly what was meant, that no dentist can well have been misled. Still this correction is due to the parties named herein.—ED.

Obituary

Died at West Brattleboro, Vt., Oct. 2d, 1875, James Adkins Clark, D.M.D., M.D., aged twenty-six.

Dr. Clarke began his professional studies with Dr. O. R. Post, of Brattleboro. In the fall of 1870 he entered the Dental Department of Harvard University, and pursuing the regular course of study during two seasons, graduated honorably in the class of 1872. His course at Harvard was marked by earnestness in his studies, faithfulness toward patients placed in his hands in the Infirmary practice, and great persistency in accomplishing all his undertakings.

In the course following his dental graduation he attended lectures at the Dartmouth Medical School, on those branches of general medicine to which he had not been able to devote as much time as he wished at Harvard. At the end of this course he passed the regular examination, and received the degree of M.D. in the spring of 1873.

Dr. Clarke practiced for a short time in Middletown, Conn., but failing to meet with reasonable encouragement there, he returned to Hanover, N. H., where the greater portion of his professional career was spent.

In September last, typhoid fever became epidemic in Hanover, and Dr. Clarke contracted the disease. In the middle of September he spent about ten days in Boston, and at his old home in Brattleboro. He was then prostrated with the fever, and after a very short illness, in which there was little conscious suffering, he passed out of this life, leaving a wife to mourn the loss of a kind and loving husband. Thus, at the beginning of his course, has gone from the ranks of the young men, one who sought for thorough culture and excellent practice. The community in which he practiced sustain no small loss in his death.

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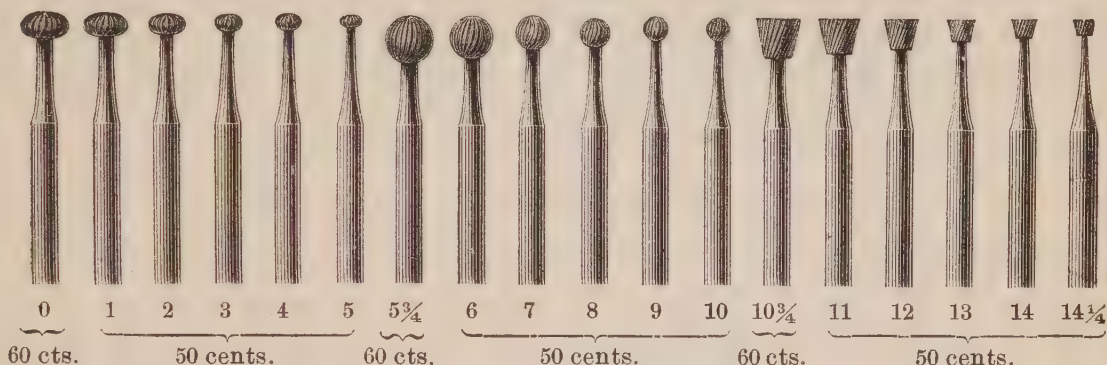
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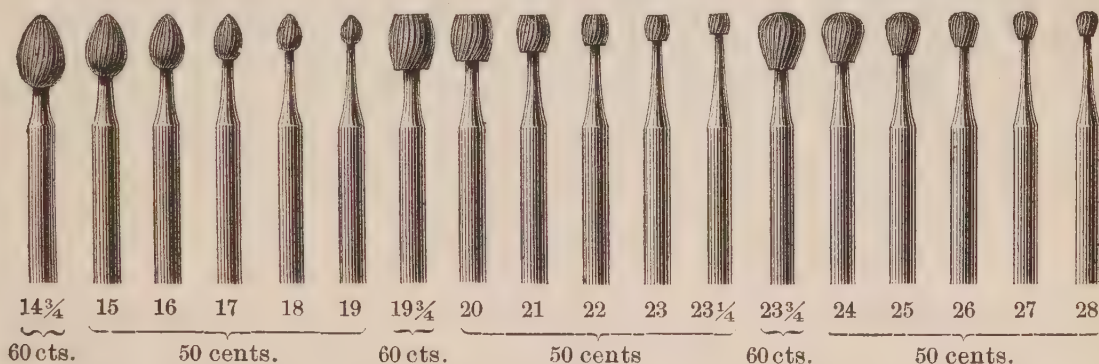
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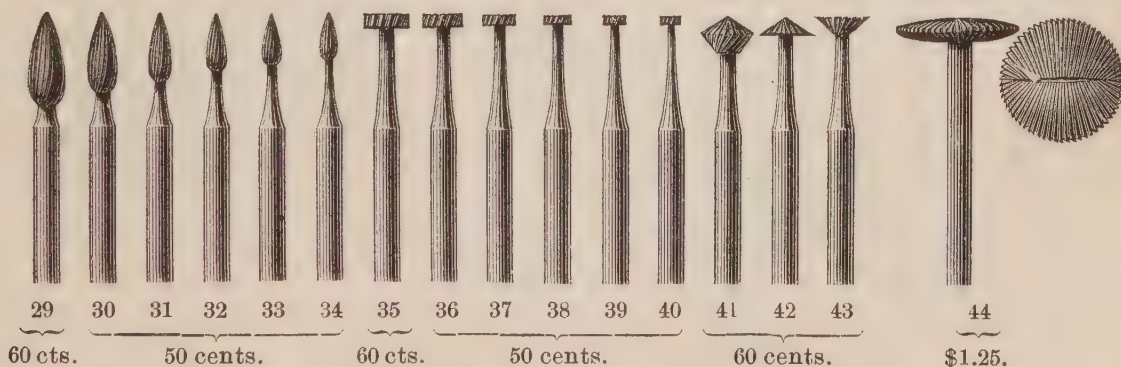
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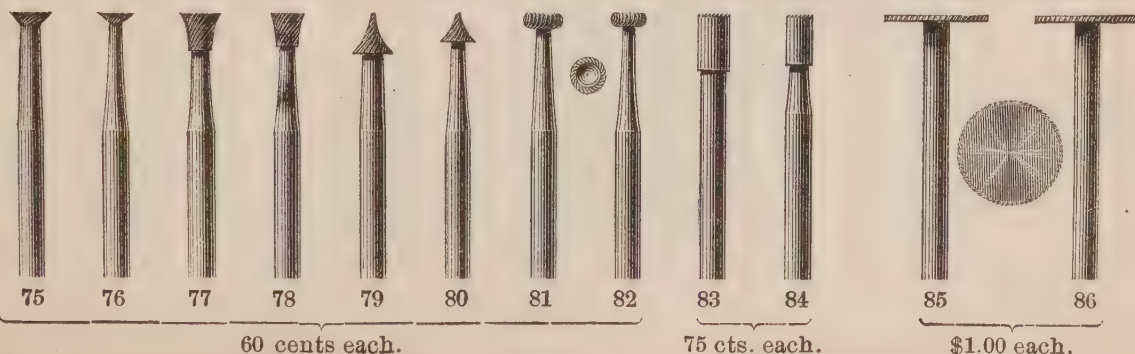
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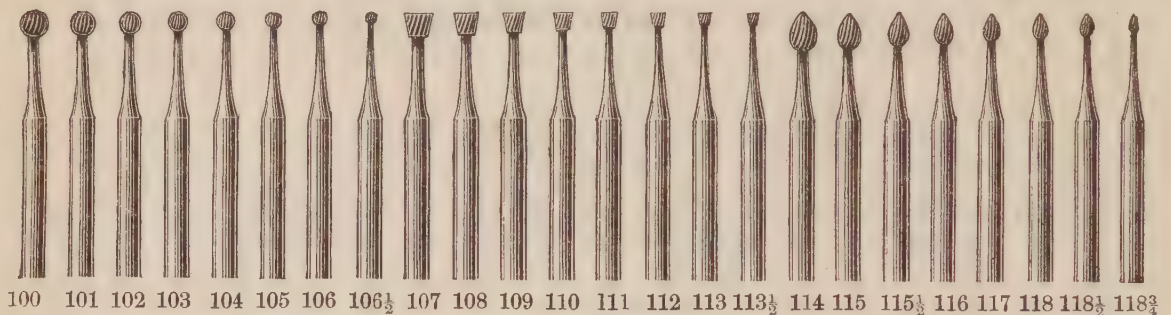


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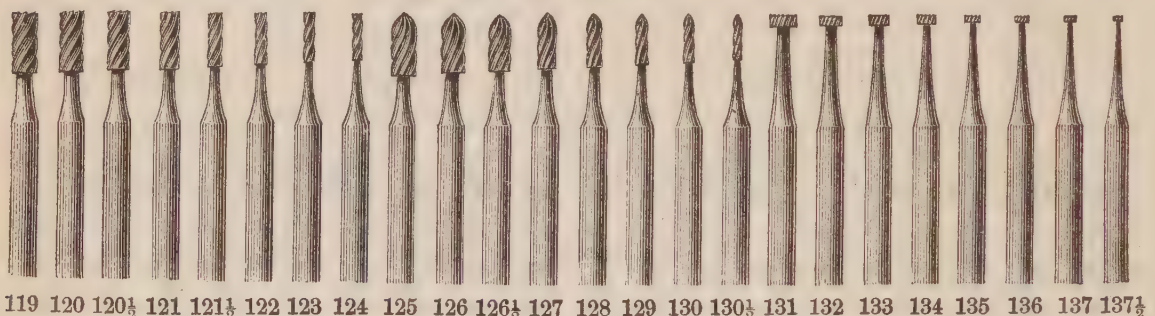
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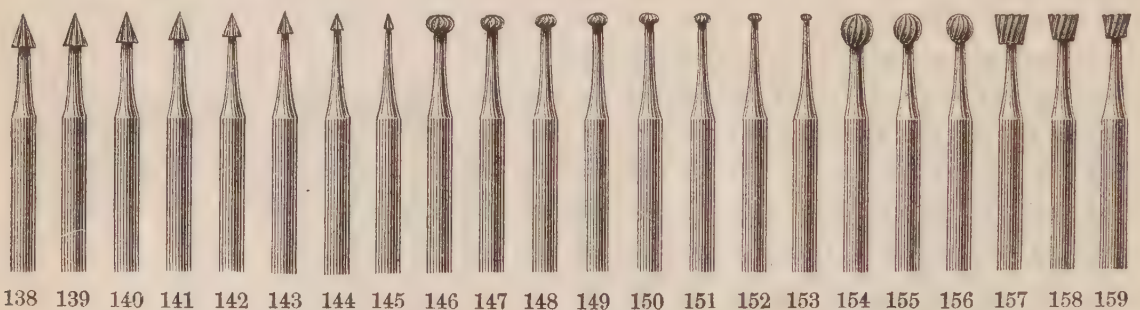
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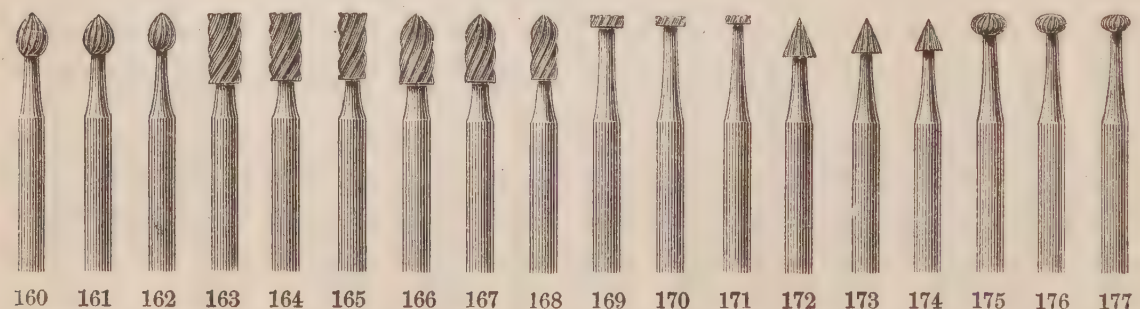


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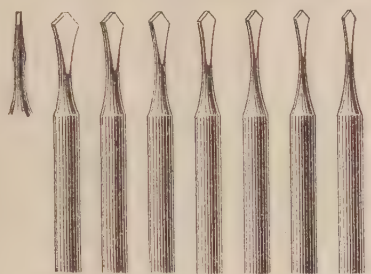
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35 cents each.

CAVITY INSTRUMENTS.

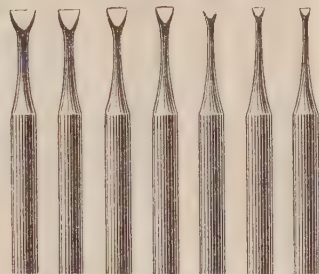
Spear Shaped Drills.



200 201 202 203 204 205 206

25 cents each.

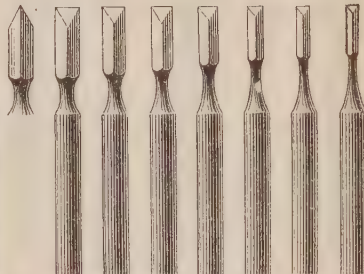
Spade Drills.



207 208 209 210 211 212 213

25 cents each.

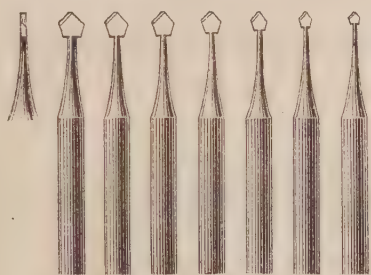
Square Drills.



213 1/2 214 214 1/2 215 216 217 218

25 cents each.

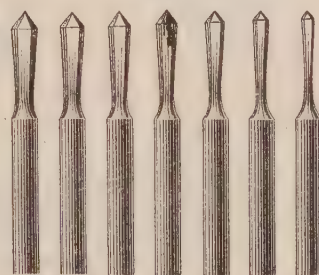
Forbes' Drills.



260 261 262 263 264 265 266

25 cents each.

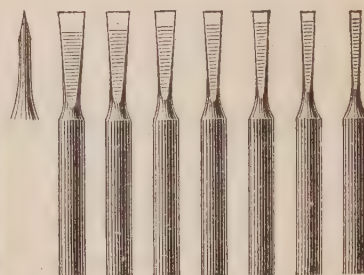
Five Sided Drills.



267 268 269 270 271 272 273

25 cents each.

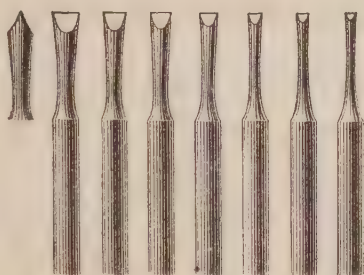
Flat Drills.



274 275 276 277 278 279 280

25 cents each.

Round Drills.



281 282 283 284 285 286 287

25 cents each.

Drills for Mack's Screws.



288 289 290 291

40 cents each.

No 291 is for Gold Screw No. 1

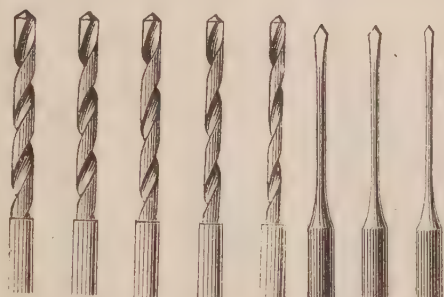
" 290 " " " 2

" 289 " " " 3

" 288 " Pivoting Screws.

NERVE INSTRUMENTS.

Twist Drills.



219 220 221 222 223 224 225

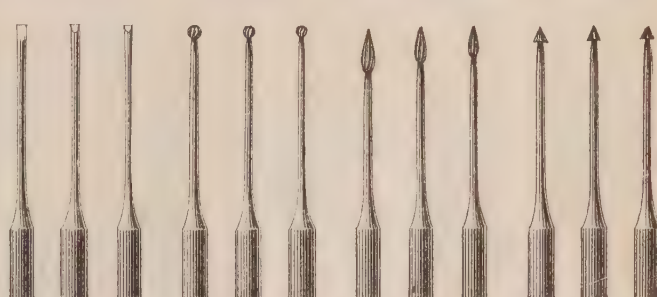
Spear Point Drills

Round Drills

Round Burs.

Flame Shape Burs.

Cone Burs.

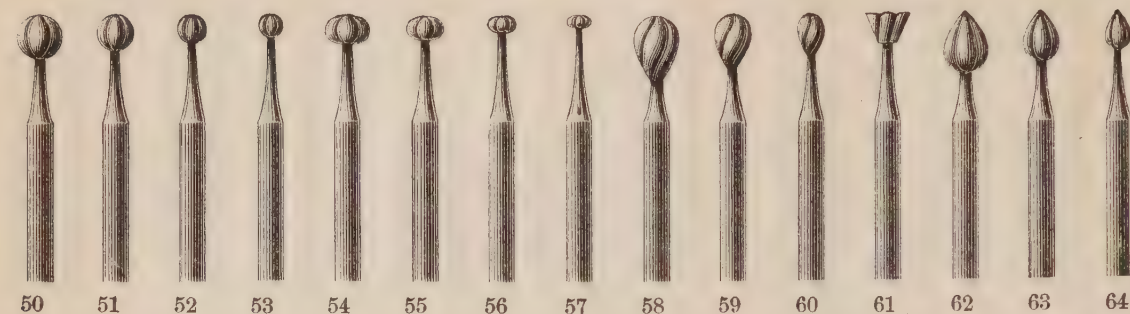


226 227 228 229 230 231 232 233 234 235 236 237 238

40 cents each.

Miscellaneous Finishing Instruments.

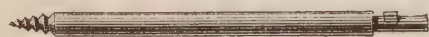
Burnishers.



75 cents each.

Same sizes, not corrugated, 50 cents each.

Screw Mandrel, without Collar.



No. 65.

13 cents.

Plain Chuck for Wood Points.



No. 69.

Plated, 35 cents each.

Plain, 25 " "

Screw Mandrel.



No. 66.

25 cents each.

Port Polisher.



No. 67.

Screw Socket, Nickel Plated, 35 cents each.



Parting Nut Mandrel.

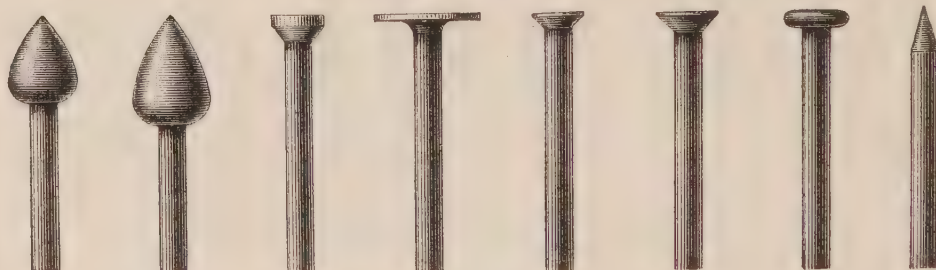


No. 68.

Nickel Plated, 40 cents each.

Plain, 30 " "

Wood Polishing Points.



Per Box of 100, assorted, \$1.25.

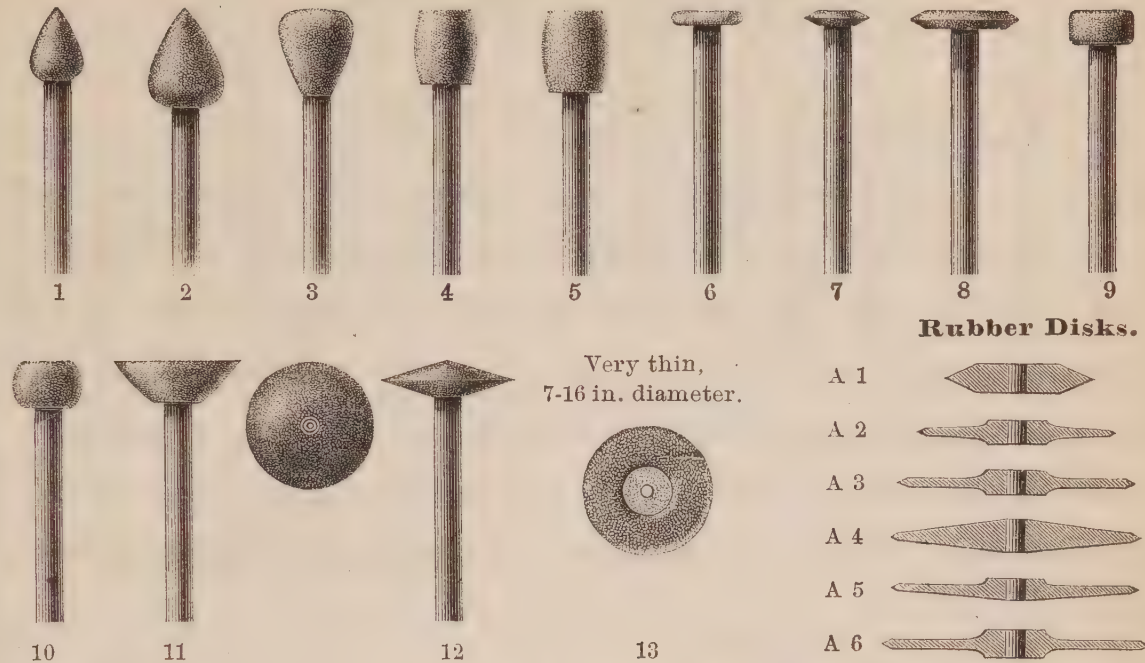
Boxwood Disks.



Price, per dozen, \$1.00.

CORUNDUM POINTS.

Forms by Dr. A. L. Northrop.



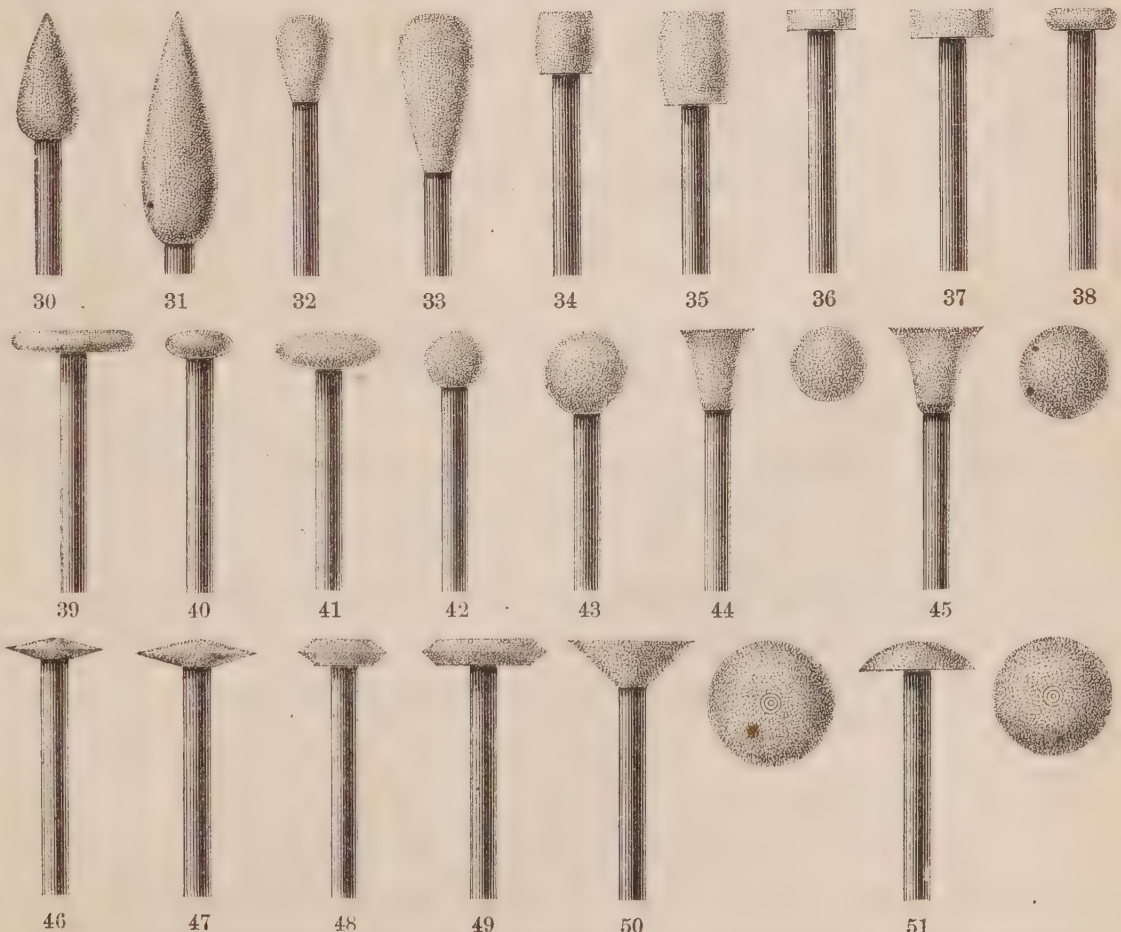
Mounted, per set.....\$1 50
 Mounted, per dozen..... 1 50
 Not Mounted, per set..... 75
 Not Mounted, per dozen..... 75

Wheels as in cut No. 13, per dozen.....\$1 50
 Or Mounted, per dozen..... 2 75
 Rubber Disks, Hard, per dozen }
 Rubber Disks, Soft, per dozen } 1 20

Soft Rubber Points, Shapes of Corundum Points, per dozen.....75 cents.

ARKANSAS AND HINDOSTAN STONE.

These are kept in stock, mounted on Mandrels, of the forms represented below. Scotch Stones will be made to order of any of the same forms, but this Stone is so soft, that we do not deem them desirable except for such shapes as are without sharp angles.



Arkansas Stones, \$1.00 each. Hindostan Stones, 50 cents each. Scotch Stones, 30 cents each.

STONED BURS.

The teeth of these Burs are laid out with great accuracy, and then filed to *exactly equal length*, but are not brought to a cutting edge. The Bur is next tempered, and each tooth *afterward* stoned to a fine edge. This secures a Bur perfect in all its cutting edges, and unequaled by anything of the Bur kind. Those who have used these most, rarely buy any other kind, and assure us that they find true economy, as well as great satisfaction in their use.

We invite the fullest examination of all of our Engine Instruments, as regards

The quality of the steel from which they are made.

The shape and finish of the cutting edge.

Their temper.

The rapidity with which they cut.

Their durability.

The shaft of each instrument is *round and highly finished*, and can therefore be used without unreasonable and unnecessary injury to the nose of the hand-piece, which injury occasions unsteadiness in all the uses of the Engine.

They will bear examination in *quality and price*.

MINIM BURS.

It is impossible to accurately represent by cuts the smallest sizes of Burs that we make. We offer Cavity Burs, either Round, Inverted Cone, Bud-Shaped, Wheel, Cone-Shaped or Oval, of smaller sizes than are represented or numbered herein. Although more than ordinarily expensive to make, **we keep the price the same as for ordinary Cavity Burs.** In sending orders, please specify the shape desired, as for example: "ONE DOZEN ROUND MINIM BURS."

SPECIAL OFFER.

A discount from list prices of ten (10) per cent. will be given on all cash orders for Engine Instruments which amount to twenty-five dollars or upwards.

PRICES OF ENGINE EQUIPMENTS.

Plug Finishing Burs.....	\$6 00	per doz.	50 cts. each
Extra Size Finishing Burs.....	7 20	"	60 "
Stoned Finishing Burs.....	12 00	"	1 00 "
Extra Sizes proportional prices.			
Excavating or Cavity Burs.....	3 00	"	25 "
Extra Sizes.....	4 20	"	35 "
Stoned Excavating or Cavity Burs.....	6 00	"	50 "
Stoned Excavating or Cavity Burs, Extra Sizes proportional prices.			
Minim or very Small Burs , Round, Bud, Wheel,			
or Cone shaped.....	3 00	"	25 "
Right Angle Cavity Burs and Drills.....	3 00	"	25 "
Trephines.....			75 "
Screw Mandrels, with Collar.....	3 00	"	25 "
Screw Mandrels, blanks (no collar), for Mounting Wooden			
Wheels, Leathers, &c.....	1 50	"	13 "
Large Knife Edge Wheel Burs.....			1 25 "
Plate Saws.....			1 00 "
Burnishers, Corrugated.....	9 00	"	75 "
Burnishers, Smooth.....	6 00	"	50 "
Parting Nut Mandrels, Nickel Plated.....	4 80	"	40 "
Parting Nut Mandrels, plain.....	3 60	"	30 "
Drills of all forms and sizes (except Nerve Drills.....	3 00	"	25 "
Nerve Instruments.....	4 80	"	40 "
Leathers, Mounted.....	3 00	"	25 "
Leathers, not Mounted.....	1 00	"	10 "
Bands for Engine, Morrison.....	1 20	"	10 "
Bands for Engine, Suspension.....	1 80	"	15 "
Ive's Tongue and Cheek Protectors (2 sizes), to be used			
with disks, wheels, &c..... per set.	1 50		75 "
Right Angle Attachments.....			5 00 "
Arkansas Stones, Mounted.....	12 00	"	1 00 "
Hindustan " ".....	6 00	"	50 "
Scotch " ".....	3 60	"	30 "
Corundum Points, Mounted.....	1 50	"	13 "
Corundum Points, not Mounted.....	75	"	7 "
Rubber Disks, hard or soft.....	1 20	"	
Twist Drills.....	4 80	"	40 "
Boxwood Disks (3 sizes, see cut).....	1 00	"	10 "
Wood Socket or Port Polisher, plain.....			25 "
Wood Socket or Port Polisher plated.....			35 "
Wood Socket or Port Polisher, Screw Socket.....			35 "
Corundum Wheel, No. 13, $\frac{7}{16}$ in. diameter.....	1 50	per doz.	13 "
Soft Rubber Points, shape of Corundum Points.....			75 cts. per doz.
Wood Polishing Points.....			\$1 25 per Box.

We are prepared to furnish any of the instruments illustrated in this pamphlet, adapted to either the A, B, or C style Hand Piece. The C style Instrument also fits the S. S. White Engine.

In ordering instruments, designate them by the numbers, and state whether they are wanted to fit the (A,) (B,) or (C) hand-piece. Each bur is numbered on its shank.

Style A.



Style B.



Patented Sept. 10, 1872.

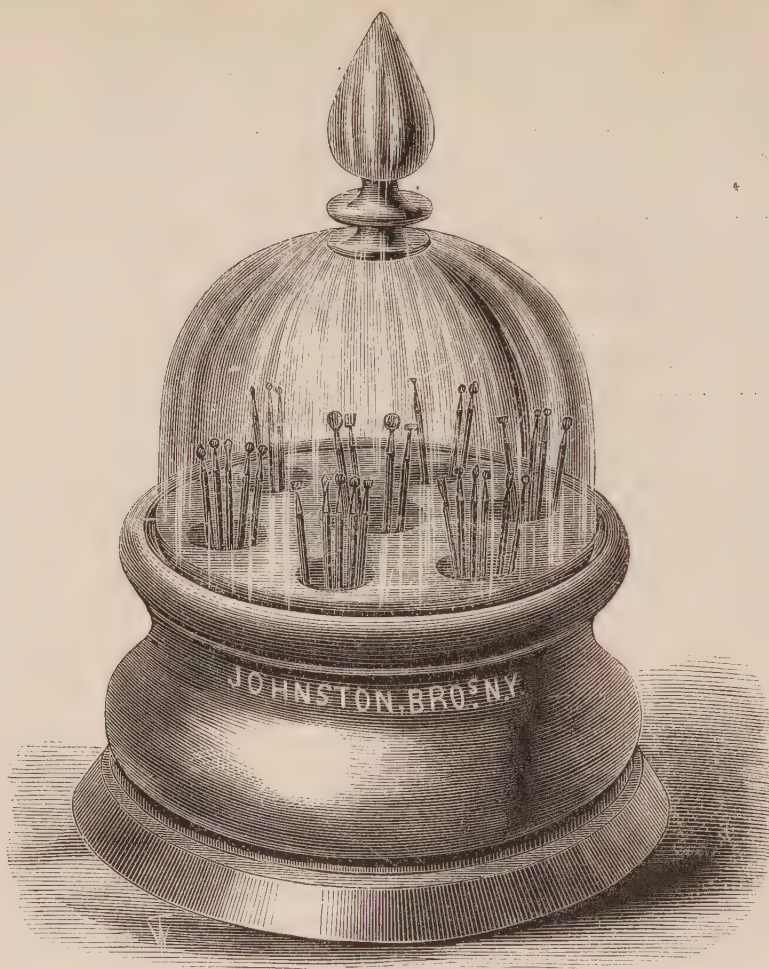
Style C.



Patented Feb. 24, 1874.

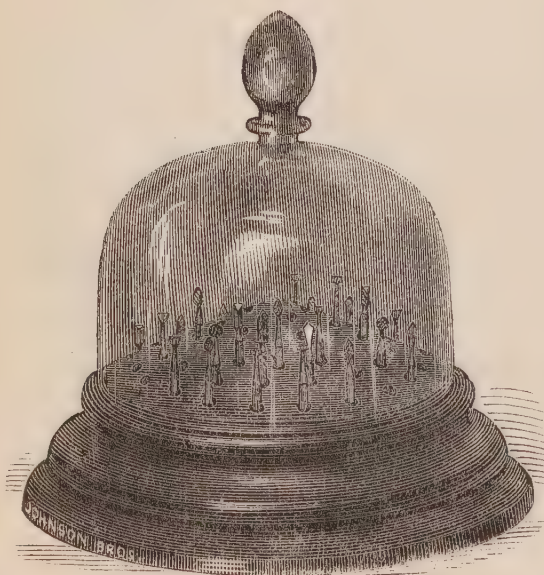
NOTE.—To fasten Burs in the Hand Piece, it is well to push back the catch-spring with the left hand while inserting the Bur with the right hand.

Instrument Stands for Engine Tools.

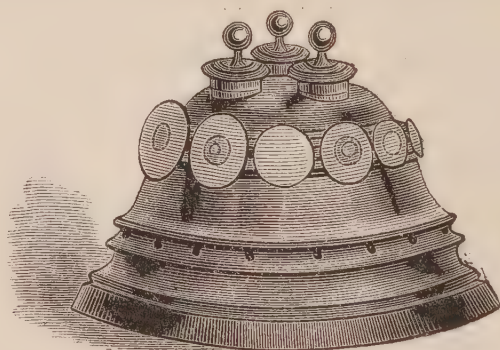


No. 1 as above. **No. 2** with many more, but smaller holes.

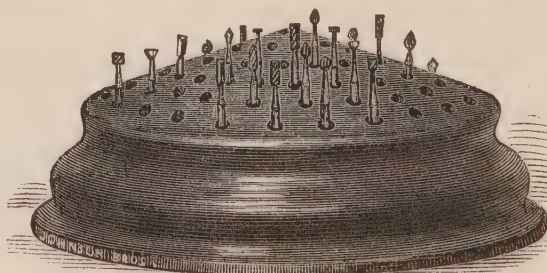
This is made of rosewood and maple in alternate layers, and is very ornamental. Besides the form shown above, we have another like this in all respects, except that the holes into which the burs are placed are made so small as to hold only one or two instruments each. We call this No. 2.



No. 4.



No. 5.



No. 3.

The cuts above show at a glance the advantages offered by these new styles of stands. The conical shape of the top of the bur stand renders it much easier to select and to remove any particular instrument desired than is possible when the top of the stand is flat, because in the first named case each bur is brought distinctly into view.

No. 5, for keeping mounted disks, has been long needed, both on the score of economy and convenience. It is provided at its apex with three stoppered receptacles for polishing *pastes*, each having a brush with which to convey the paste to the buff or wheel with which it is used.

Instrument stands Nos. 1 and 2, are made of alternate layers of rosewood and maple, highly polished, and are hence more expensive than the later styles, which are of black walnut. They are especially adapted for the A and B style burs, but also answer perfectly with C burs.

PRICES.

Nos. 1 or 2, complete, each.....	\$2 00
Or without glass cover.....	1 50
No. 3.....	1 00
No. 4.....	1 50
No. 5, having three cups for paste.....	2 00

SPECIAL NOTICE.

We have on hand a small stock of REMODELED MORRISON DENTAL ENGINES, in every respect first quality and new. Having determined to discontinue manufacturing this style of Engine, we offer the present lot, (until further notice) at Thirty Dollars each, net cash. Right Angle, Five Dollars ; boxing, Two Dollars.

REFLECTORS.



PATENTED FEB. 16th, 1875.

This reflector is designed to concentrate a strong light upon the cavity. It is so constructed that it can be readily attached to any rubber dam clamp, and by means of a ball joint the mirror can be adjusted to throw light upon any point in the mouth. The operator will readily perceive the great advantage to be derived from this invention in operations upon posterior cavities in molars. The mirror being held in position by the clamp (as shown in one of the cuts), the hands of the operator are entirely free. It is thought that two sizes will meet all requirements.

PRICES.

No. 1, diameter 1/2 in.....	\$2 75
No. 2, “ 5/8 in.....	2 75
Set.....	\$5 50

JOHNSTON BROTHERS,
812 Broadway, N. Y.

THE MORRISON DENTAL CHAIR.



**Price \$150.00, or, with Castors, \$160.00. Boxing, \$5.00.
Spittoon Attachment, \$8.00.**

It possesses great superiority over any chair before offered to the profession, and is at the same time less expensive than any other first-class chair. Some of its points of superiority we here enumerate :

- 1st. All the advantages of any low-based chair, and also of any high-based chair, are here secured in a single chair. In it the patient can be placed lower than in the lowest-based chair made, or higher than in any other of which we have knowledge. At its lowest position the seat is fifteen inches, and at its highest position forty-two inches above the floor.
- 2d. The operator using the Morrison Chair can either stand or sit at his work, as he may choose, working with equal convenience in either position.
- 3d. It has been a very general complaint that dental chairs are too wide at the back, so holding the operator away from his work. Here this difficulty is overcome. The chair is narrow at the back, so that the operator need not stretch to reach the patient, but *can lower either arm of the chair out of the way* and so be as near the patient as he may choose.
- 4th. It can be changed from its lowest to its highest position in seven seconds — a celerity impossible in any chair raised by a screw.

- 5th. It can be very readily and perfectly adapted to operations on children of any age
First. Because in it the child can be raised as high as needed for the tallest operator.
Second. It provides a comfortable back and head rest, exactly as for grown persons.
Third. The footstool can be lengthened or shortened, to suit children of any size.
- 6th. The back of the chair can be lengthened or shortened rapidly and at will.
- 7th. The lower part of the back can be thrown forward to support the small of the patient's back.
- 8th. The chair, when adjusted to any position, is firm or steady wherever placed, and this is *especially true of the head-rest.*
- 9th. It occupies less room than any other operating chair.
- 10th. Although the footstool, when at its extreme length, is much longer than any other made, yet a person of ordinary weight can stand on its extremity without tipping the chair.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

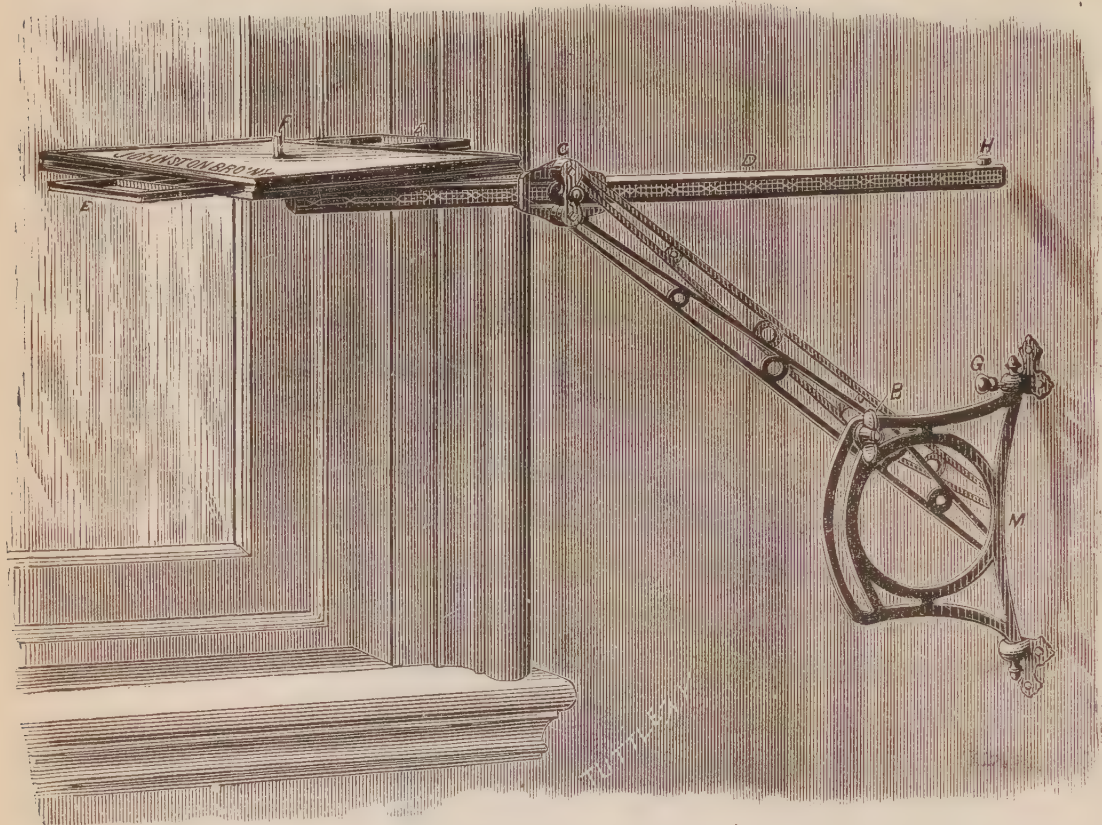
We venture to append the names of some of those who have used the Morrison Chair. As the list of purchasers is too long for publication here, we name a few only from each section of the country.

O. A. JARVIS, *New York.*
D. H. GOODWILLIE, *New York.*
O. A. HOUGHTON, *Brooklyn, N. Y.*
A. C. HAWES, *New York.*
W. B. CHAMBERS, *Newark, O.*
C. B. ANSART, *Oil City, Pa.*
M. H. WEBB, *Lancaster, Pa.*
T. W. FRENCH, *Gt. Barrington, Mass.*
E. H. EVANS, *Rockland, Me.*
E. O. SMITH, *Salem, Oregon.*
W. F. LEWIS, *Winona, Minn.*
T. J. McMILLAIN, *Paris, Ky.*
G. W. TINDALL, *Kansas City, Mo.*
A. W. KINGSLEY, *Elizabeth, N. J.*
J. N. SCRANTON, *Bennington, Vt.*
O. A. GLIDDEN, *New York.*

JAMES MCMANUS, *Hartford, Conn.*
R. F. BORDEN, *Red Bank, N. J.*
F. A. SHAILER, *Essex, Conn.*
WILLIAM DUTCH, *San Francisco, Cal.*
R. B. DONALDSON, *Washington, D. C.*
B. F. COY, *Baltimore, Md.*
C. P. CLIFFORD, *Lowell, Mass.*
S. H. HINKEL, *Stannton, Va.*
E. G. WHEELER, *Mobile, Ala.*
J. A. DAVIS, *Chicago, Ill.*
C. B. ERICHSON, *New Britain, Conn.*
H. BENTLEY, *West Meriden, Conn.*
H. H. SAYLES, *Elmira, N. Y.*
PRESTON DAY, *Warren, R. I.*
E. T. DARBY, *Philadelphia, Pa.*
G. W. TRIPP, *Auburn, N. Y.*

H. B. SANDS, M.D., Surgeon, *New York*

MORRISON DENTAL BRACKET.



PRICES.

With Black Walnut Table, 12 inches square.....	\$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather.....	40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket.....	17.00.
Boxing.....	\$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

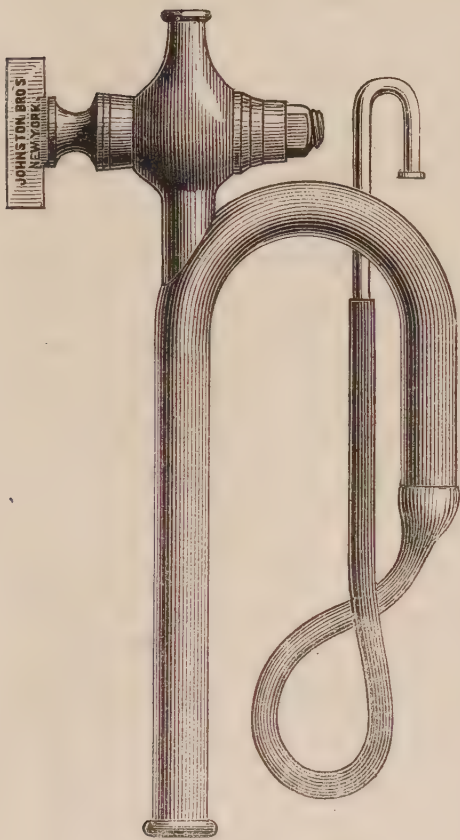
- 1st. It combines a greater variety of range and movement than any other.
- 2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
- 3d. It provides a clean receptacle for foil and instruments.
- 4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
- 5th. Its drawers extend through the table and can be opened from either side.
- 6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

ELLIOTT'S SALIVA EJECTOR.



PRICE \$5.00.

placed in a tumbler of water, the tumbler will be completely emptied in a moment.

Three pieces of rubber tube are required with it as ordinarily used.

1st. A short piece between the supply pipe and the stop-cock. This is sent with the Ejector.

2nd. A waste pipe from the bottom of the long arm to wherever it is desired to discharge the water.

If the Ejector is to be attached to one of the faucets of an ordinary wash-basin, the waste-pipe may be very short, or dispensed with altogether. Price 25 cents per foot.

3d. From the short arm to the dental chair, this tube, as furnished with the Ejector, is four feet long. If a longer tube is needed it can be supplied at 20 cents per foot, on order.

JOHNSTON BROS.,

812 Broadway, New York.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or “chattering” which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

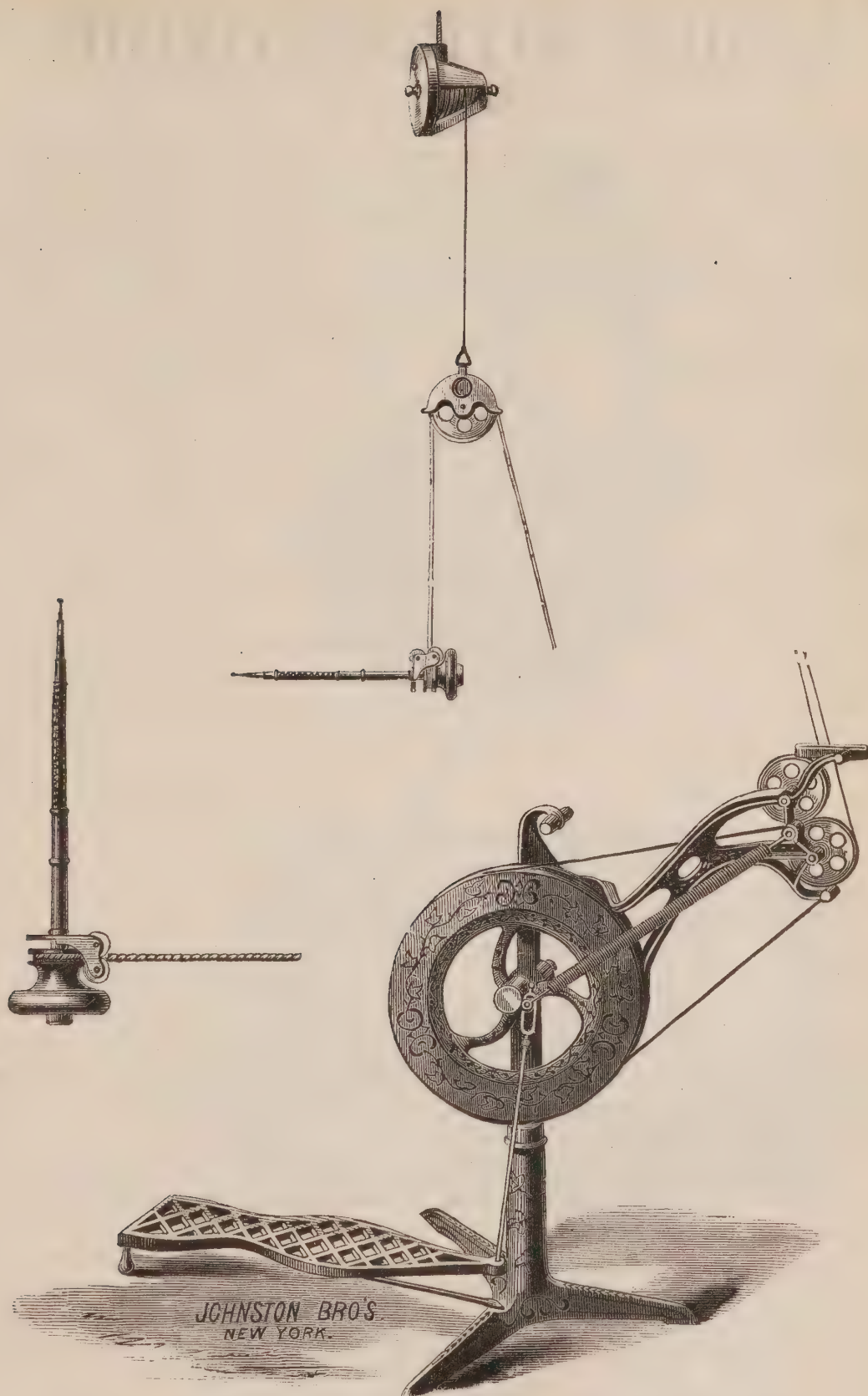
4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a “*light running*” Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROTHERS, 812 Broadway, N. Y



SUSPENSION DENTAL ENGINE.

(DR. ELLIOTT'S INVENTION.)

Price, \$50.00. Right Angle Attachment, \$5.00. Boxing, \$1.00.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($\text{NO}^2 + 2\text{O} = \text{NO}^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid Nitrous Oxide*, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether.....	I	death to 23,204 administrations.	
Chloroform.....	I	" 2,723	"
Mixed Chloroform and Ether....	I	" 5,588	"
Bi-chloride of Methylene.....	I	" 7,000	"
NITROUS OXIDE.....		no Deaths in 75,000	"

Edward R. Squibb, M.D., than whom our country has no more able pharmacist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

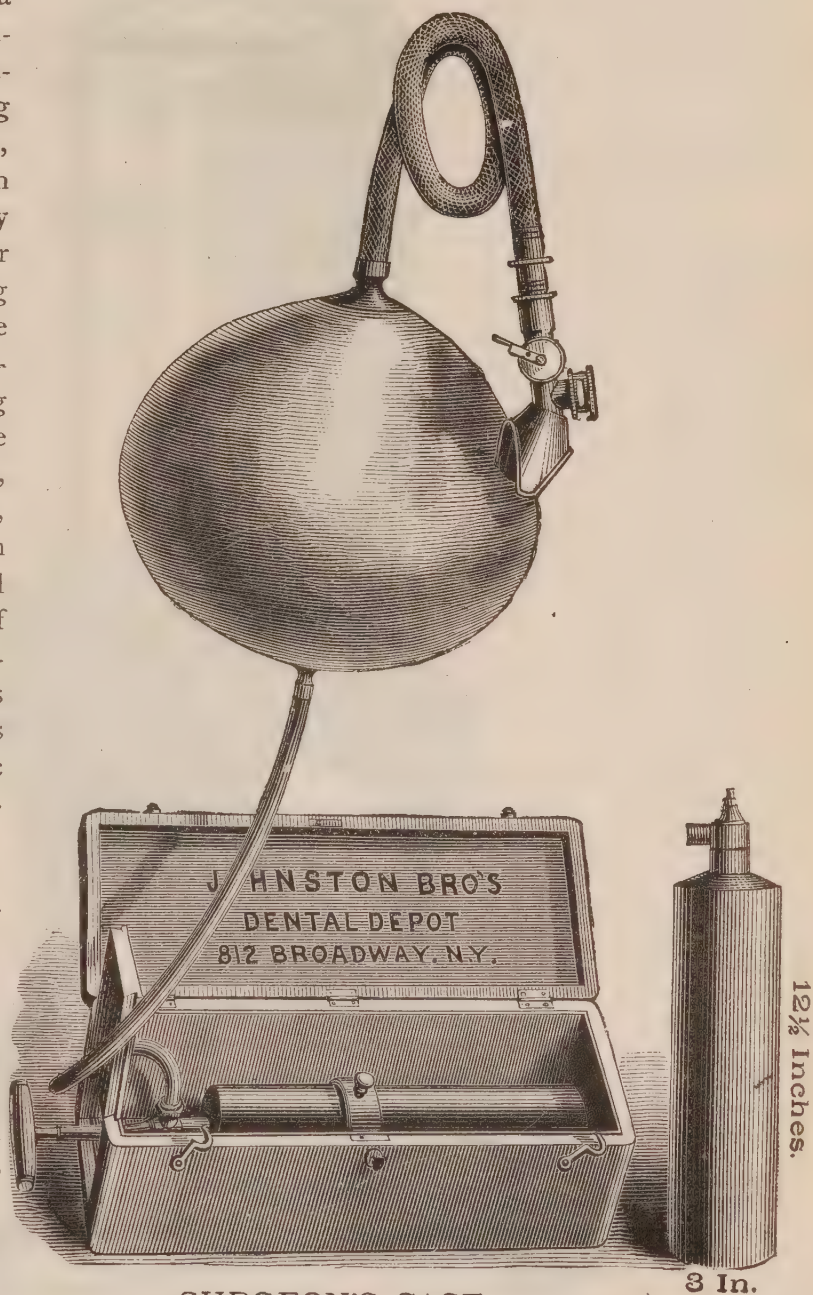
When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

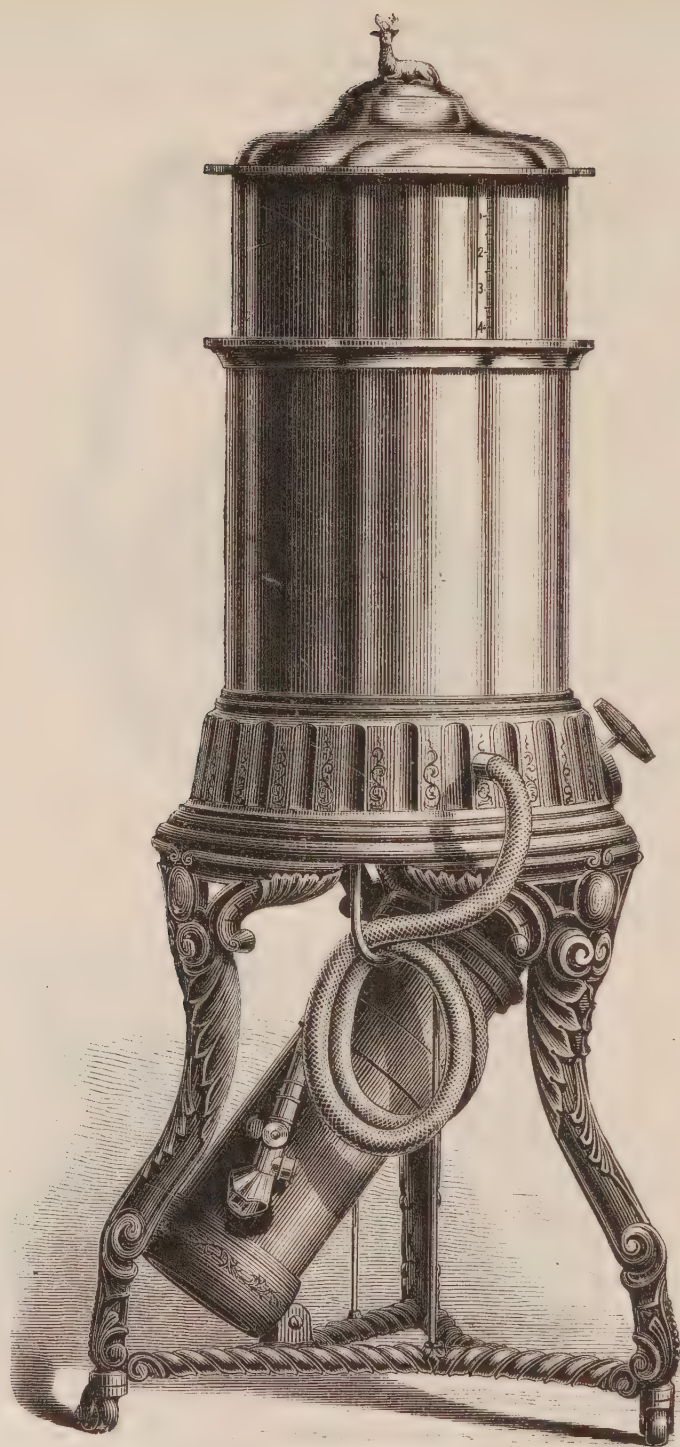
Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers



SURGEON'S CASE.

without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



NICKEL-PLATED GASOMETER
AND ORNAMENTED STAND
FOR LIQUID NITROUS OXIDE.

For Prices.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen: we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas—this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality*.

JOHNSTON BROS., 812 Broadway, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler **No. 1** . . . \$42 00

Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic

Inhaler **No. 2** . . . 45 00

Boxing either, \$1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas 16 00

Refilling Cylinder 6 00

Nickel-Plated Gasometer, with ornamented iron stand 128 00

Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered Tubing) 12 00

1000 Gallon Cylinder 36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of $4\frac{1}{2}$ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at $4\frac{1}{2}$ cents 45 00

Morocco covered case, with ring and thumb screw, velvet lined 12 00

Polished bl'k walnut “ “ “ “ “ “ 13 00

Of these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity) 5 00

Rubber Bag, with covered inhaler tubing, extra size 7 00

Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection 9 50

Key, Nickel Plated 1 50

Wrench, “ 50

Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag 1 50

Covered Inhaler Tubing, per foot 50

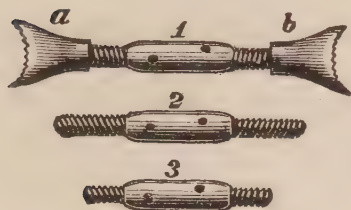
Plated Connection to fit old style Inhaler 1 00

JOHNSTON BROS.,

812 Broadway, N. Y.

JACK SCREWS.

Devised by Dr. C. S. LONGSTREET,
with Dr. A. McCOLLOM's Im-
proved Head.



This device is greatly prized by
those who have used it.

PRICES.

Full Set, as above, Nickel Plated,
screw and two extra bars..\$2.50
Jack Screw, Nickel Plated.....1.50
Bars, " " 50

1st. It has in convenient
form for use three sizes of
punches.

2d. If one size breaks it
can be replaced (by mail)
at a trifling expense.

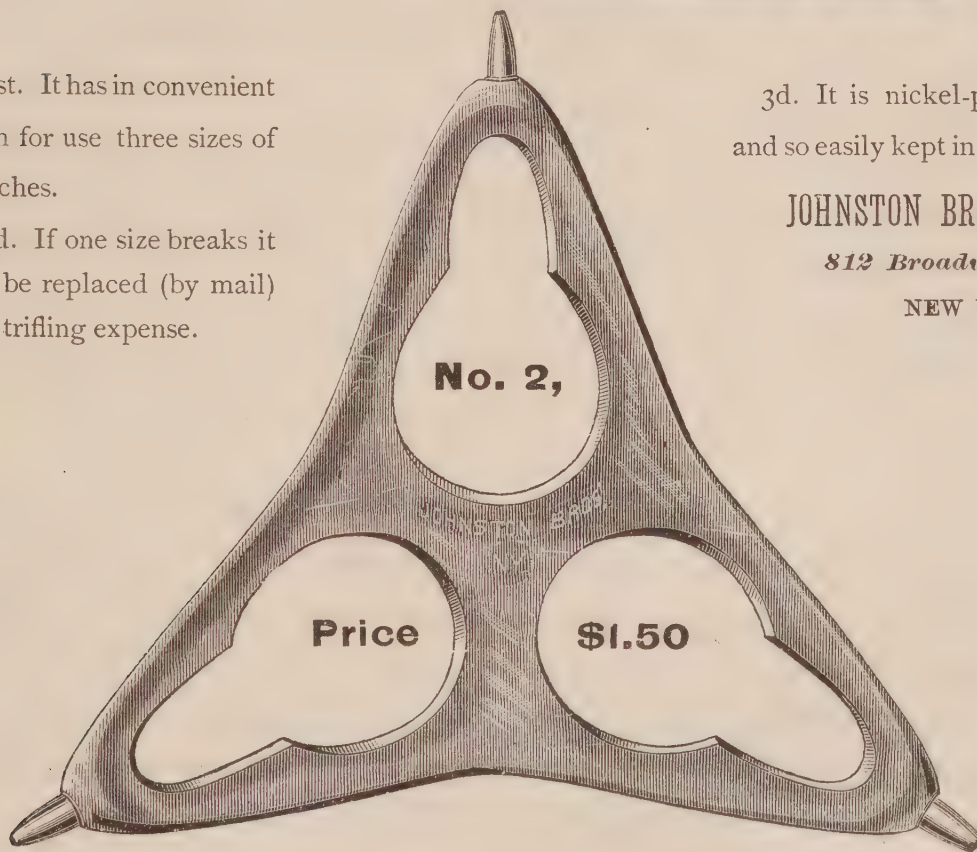
Improved Triplex Rubber-Dam Punch.

Devised by Dr. F. W. DOLBEARE.
TWO STYLES, Nos. 1 and 2.



3d. It is nickel-plated,
and so easily kept in order.

JOHNSTON BROS.,
812 Broadway,
NEW YORK.



SECOND-HAND CHAIRS.

Dentists who have supplied themselves with the Morrison Chair, frequently request us to sell the chairs previously used by them. We therefore can ordinarily supply, at cheap rates, second-hand chairs of any of the varieties hitherto most used. For particulars, address

JOHNSTON BROS.,
812 Broadway, N. Y.

"Premium" Gutta Percha Stopping.

It will not be disputed that a filling which offers the following properties, is sure of a hearty welcome by both dentist and patient.

"Premium" Gutta Percha Stopping,

1st.—Is thoroughly plastic, but not sticky; in this respect an improvement on previously offered Gutta Percha.

2d.—It is very nearly the color of the tooth.

3d.—It adheres tenaciously to the walls of the cavity, and so protects the tooth from decay. Osteoplastic fillings frequently fail, by disintegration around the margins of the cavity, and admit moisture to the seat of previous decay.

4th.—It does not work "salvy," and by sticking to the *warmed*, (but not *hot*,) instrument by which it is applied, drag itself from the position in which it has just been placed—a common fault with Gutta Percha hitherto.

5th.—It is non-escharotic, and so may be used directly over an exposed nerve, which cannot be safely done with the most used "soft fillings."

6th.—It is a non-conductor of heat, and hence will not transmit thermal changes, from a cold draft of air, or from hot or cold food to the under-lying nerve. In this it is superior to the best metallic fillings.

7th.—It is readily removable by proper instruments, when used as a temporary filling, more readily than either amalgams or cements.

8th.—It can be used in cavities having frail walls, or where the tooth is sensitive, since very little force is required for packing it.

9th.—It hardens promptly.

Although used ordinarily as a temporary filling, instances are numerous where a Gutta Percha filling has lasted ten or twelve years. We think a variety can be made which will have sufficient hardness to make it fit for permanent fillings.

(OVER.)

Many operators esteem it a great convenience; and often an advantage to the patient, to be able, after having properly prepared a cavity, to leave it a short time, and examine again before inserting the permanent gold filling.

No other material compares with Premium Gutta Percha for this purpose. The tooth is perfectly protected by it, and temporary filling inserted and taken out without pain, and with scarcely any loss of time.

JOHNSTON BROS.,

812 Broadway, N. Y.

We append letters from two well known and highly esteemed practitioners of New York.

44 WEST 46TH ST., NEW YORK, Nov. 10th, 1875.

MESSRS. JOHNSTON BROTHERS:

Dear Sirs:—In reply to the question asked in your letter, I would say I have been using your Improved Gutta Percha Stopping for temporary work the last few days, but have not had time to test the expansion, contraction or durability of it. It is easily manipulated and worked to the margin of the cavity, without any roping or pulling away while finishing. I hope you have been able to imitate the "*Old Bevins*" Stopping. If so, it must be a success.

Very Truly Yours,

A. L. NORTHROP.

NEW YORK, Nov. 5th, 1875.

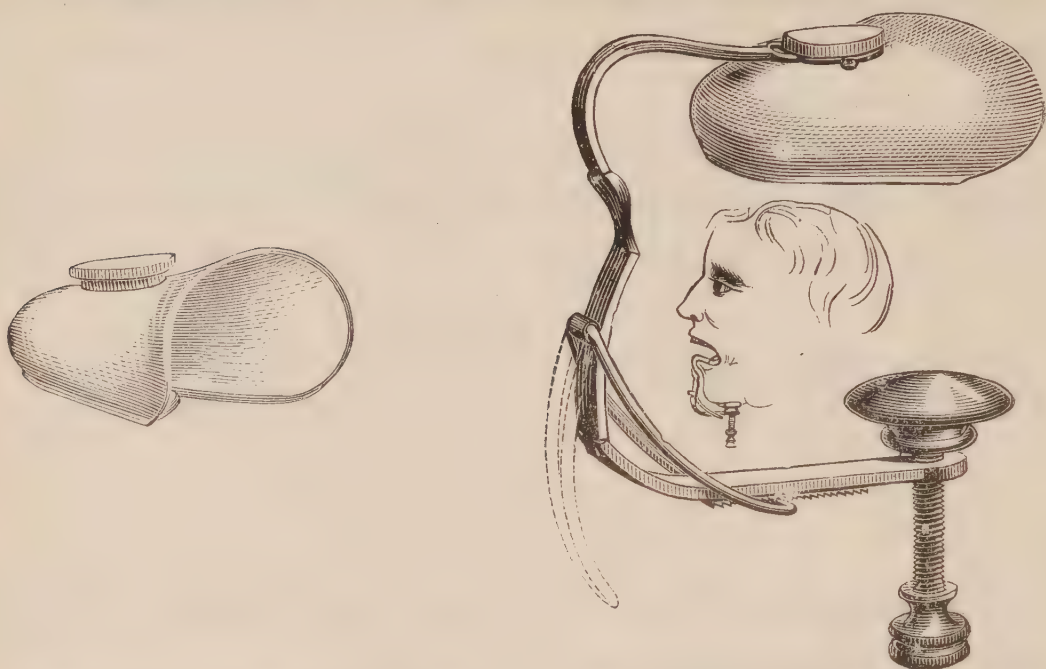
JOHNSTON BROTHERS:

Gentlemen:—In reply to your inquiry as to the qualities of the Gutta Percha you sent me, I think I may safely say that in the somewhat limited time I have had for testing it, I have found it equal to the best, if not the best I have ever used. You will remember that the "*Bevins*" of twelve or fifteen years ago has been the standard of comparison for Gutta Percha stoppings, and to obtain something equal to that in quality and durability has been greatly desired. I hope you have excelled it. The sample I have packs with perfect facility, without being sticky or ropy, and does not draw away from the surface of the cavity. If now it becomes firmer and harder by use, as it promises, the profession will be indebted to you for a most valuable addition to their resources for saving the teeth. Accept my thanks for even a two months opportunity of using an article so much better than any thing I have seen for years before.

Very Truly Yours,

W. A. BRONSON.

OSBORN'S TONGUE HOLDER.



Osborn's Tongue Holder and Duct Compressor. Is Cleanly, and Reflects Light in the Mouth.

This is by far the best Tongue Holder and Duct Compressor ever offered to the profession. The cut exhibits one adjusted as when in the mouth, also a view of one in use.

It possesses the following advantages, in addition to those of other apparatus designed for the same purpose.

1st. It covers the tongue, and so completely protects it from accident, while at the same time permitting to the patient some chance for changing its position *inside of the cup*.

2d. The cup which covers the tongue being of the finest white porcelain, *reflects light in the mouth*, and so *greatly* aids the operator.

3d. The cups can be readily and perfectly washed, and the use of the apparatus is therefore far less objectionable to the patient than is that of the ordinary metallic tongue holder.

4th. This apparatus is so readily applied that it is often used when the application of rubber dam would be difficult, or require considerable time. The cup pressing upon a pledget of spunk or bibulous paper nicely placed upon the ducts effectually prevents the flow of saliva.

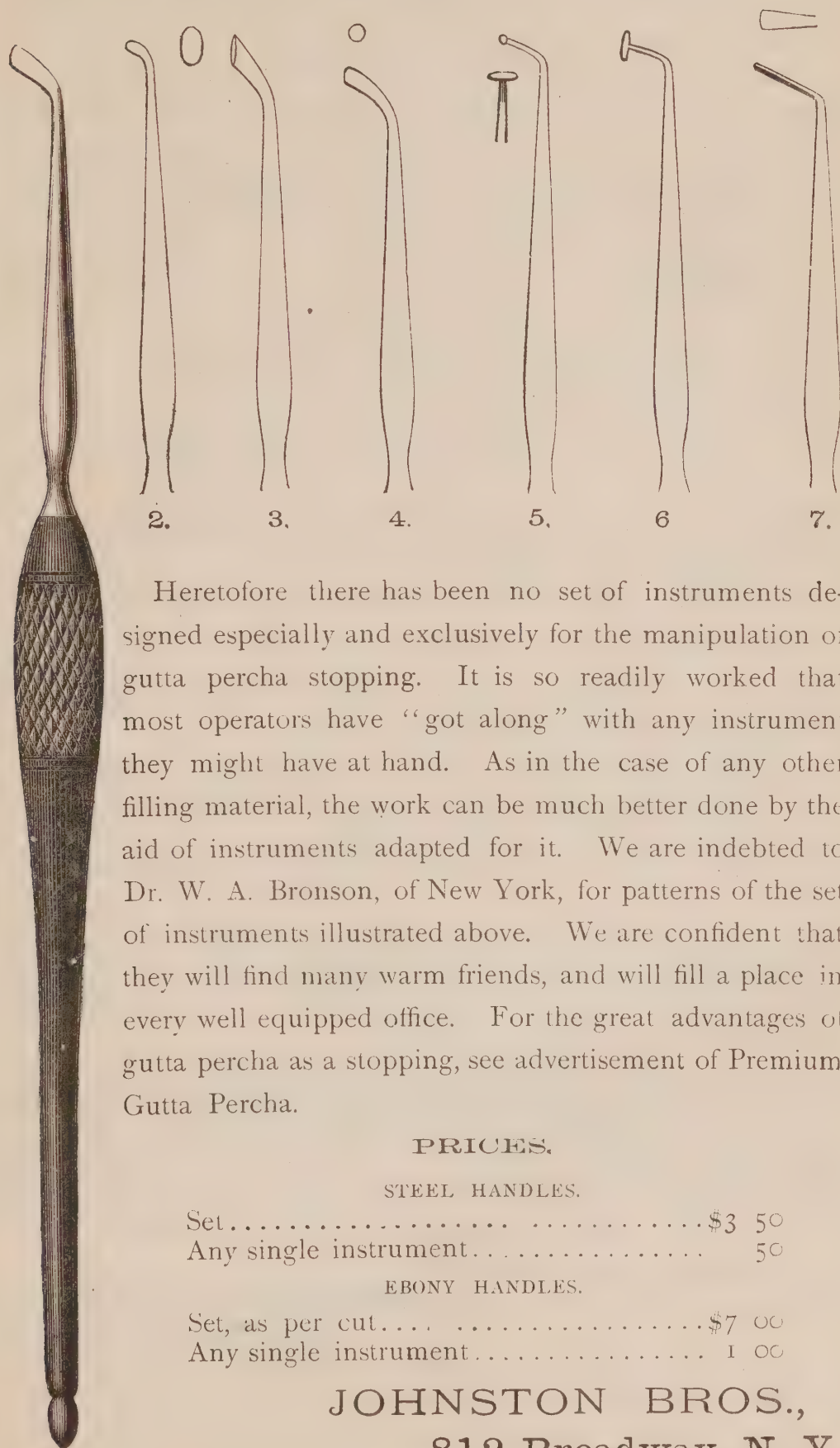
It is recommended by Drs. William H. Allen, W. C., Bennett, and Frank Abbott, of New York city, and C. Fones, of Bridgeport, Conn.

PRICES.

Complete, with three porcelain cups	\$7 50
Sets of three cups	2 50
Single cups	1 00

JOHNSTON BROTHERS.

DR. W. A. BRONSON'S GUTTA PERCHA INSTRUMENTS.



Heretofore there has been no set of instruments designed especially and exclusively for the manipulation of gutta percha stopping. It is so readily worked that most operators have "got along" with any instrument they might have at hand. As in the case of any other filling material, the work can be much better done by the aid of instruments adapted for it. We are indebted to Dr. W. A. Bronson, of New York, for patterns of the set of instruments illustrated above. We are confident that they will find many warm friends, and will fill a place in every well equipped office. For the great advantages of gutta percha as a stopping, see advertisement of Premium Gutta Percha.

PRICES.

STEEL HANDLES.

Set.....	\$3 50
Any single instrument.....	50

EBONY HANDLES.

Set, as per cut....	\$7 00
Any single instrument.....	1 00

JOHNSTON BROS.,
812 Broadway, N. Y.

NEW YORK COLLEGE OF DENTISTRY,

1875-76.

FACULTY.

FANEUIL D. WEISSE, M.D., Professor of Regional Anatomy and General Pathology.

FRANK ABBOTT, M.D., Professor of Operative Dentistry and Oral Surgery.

ALEX. W. STEIN, M.D., Professor of Histology, Visceral Anatomy and Physiology.

F. LEROY SATTERLEE, M.D., Ph.D., Professor of Chemistry, Materia Medica and Therapeutics.

C. A. MARVIN, D.D.S., Professor of Mechanical Dentistry.

WILLIAM H. ALLEN, Clinical Professor of Operative Dentistry.

JOHN ALLEN, D.D.S., Clinical Professor of Mechanical Dentistry.

JOHN T. METCALF, Clinical Professor of Operative Dentistry.

WM. T. LAROCHE, D.D.S., Clinical Professor of Operative Dentistry.

WM. B. HURD, D.D.S., Clinical Professor of Operative Dentistry.

J. BOND LITTIG, D.D.S., Clinical Professor of Mechanical Dentistry.

D. W. WILLIAMSON, D.D.S., Demonstrator of Operative Dentistry.

A. RUST CUYLER, D.D.S., Demonstrator of Mechanical Dentistry.

C. P. KREIZER, M.D., Assistant to the Professor of Chemistry, Materia Medica and Therapeutics.

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Monday, October 4th, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions...	\$150.00
For the Course of Lectures only.....	100.00
Matriculation	5.00
Graduation Fees.....	30.00

Board may be obtained for from \$6 to \$8 per week.

For further information, address

FRANK ABBOTT, M.D., Dean,

78 West Twelfth Street, New York.

HARVARD UNIVERSITY.

Dental Department.

BOSTON, MASS. 1875-76.

FACULTY.

CHARLES WILLIAM ELIOT, L.L.D., *President*.
OLIVER W. HOLMES, M.D., Professor of Anatomy.
HENRY J. BIGELOW, M.D., Professor of Surgery and Clinical Surgery.
THOMAS H. CHANDLER, D.M.D., Professor of Mechanical Dentistry.
GEORGE T. MOFFATT, M.D., D.M.D., Professor of Operative Dentistry.
LUTHER D. SHEPARD, D.D.S., Adjunct Professor of Operative Dentistry.
NATHANIEL W. HAWES, Assistant Professor of Operative Dentistry.
EDWARD S. WOOD, M.D., Assistant Professor of Chemistry.
HENRY P. BOWDITCH, M.D., Assistant Professor of Physiology.
WILLIAM H. ROLLINS, D.M.D., Instructor in Dental Pathology.
CHARLES A. BRACKETT, D.M.D., Instructor in Dental Therapeutics.
IRA A. SALMON, D.D.S., University Lecturer on Operative Dentistry.
CHARLES B. PORTER, M.D., Demonstrator of Practical Anatomy.
CHARLES WILSON, D.M.D., Demonstrator in Charge.
GEORGE F. GRANT, D.M.D., Demonstrator of Mechanical Dentistry.

The Ninth year of this School begins on the 28th of September and continues till the last Wednesday in June. The distinction of Summer and Winter sessions being hereafter abolished. It will be divided into two equal terms, with a recess of one week at Christmas. The course of instruction will be progressive, extending over two years, the lectures of one year not being repeated in the next.

The regular examinations will be held in the following order, viz.: At the end of the first year, anatomy, including dissection, physiology and general chemistry. A certificate from the demonstrator of anatomy will be required of each student, that he has satisfactorily dissected the three parts of the body.

At the end of the second year, dental pathology, including a knowledge of gestation and diseases of women so far as they affect the mouth and throat, dental materia medica and therapeutics, oral surgery and surgical pathology, operative and mechanical dentistry. The examinations in operative and mechanical dentistry will include actual operations and the preparation of specimens of mechanical dentistry.

Every candidate must be twenty-one years of age, and of good moral character; he must give evidence of having studied medicine or dentistry three full years; he must have spent at least one continuous year at this school, have presented a satisfactory thesis and have passed all the required examinations.

The University Degree, D.M.D. (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfil the requirements.

Students may be admitted to advanced standing upon passing a satisfactory examination in a majority of the studies already pursued by the class; but no student shall advance with his class or be admitted to advance standing until he has passed such examination.

The work in the operative and mechanical infirmaries will go on throughout the course, but no student shall be permitted to operate at the chair until he has by observation and practice on extracted teeth satisfied the Professor of his fitness.

The faculty recommend young men who propose to take the degree to spend the whole of the required term of three years of study in the school. But those who wish to spend but two of the three years in the school are earnestly advised to pass their first year of study, before entering, under the direction of a *competent* private instructor.

Unsurpassed facilities for operative and mechanical practice are furnished by the infirmary of the Massachusetts General Hospital which is open throughout the year.

F E E S.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is \$200; for the second year, \$150; for any subsequent year, \$50.

For further information address,

THOS. H. CHANDLER, Dean,

222 Tremont Street, Boston, Mass.

PHILADELPHIA DENTAL COLLEGE,

Nos. 108 and 110 N. Tenth Street, above Arch.

FOURTEENTH ANNUAL SESSION, '76-'77.



FACULTY.

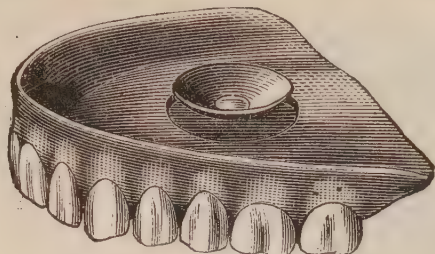
J. H. McQUILLEN, M.D., D.D.S., Professor of Physiology.
 HARRISON ALLEN, M.D., Professor of Anatomy and Surgery.
 D. D. SMITH, D.D.S., Professor of Mechanical Dentistry and Metallurgy.
 S. B. HOWELL, M.D., Professor of Chemistry and Materia Medica.
 T. C. STELLWAGEN, M.D., D.D.S., Prof. of Dental Pathology and Op. Dentistry.
 EDWARD L. HEWITT, D.D.S., Demonstrator of Operative Dentistry.
 ALONZO BOICE, D.D.S., Demonstrator of Mechanical Dentistry.
 J. FRANKLIN WARDWELL, Assistant Demonstrator.

THE DISPENSARY and Laboratory open all the year.

Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June. *Fall Preliminary Lectures*, commencing Monday, September 4th, will continue daily until November. Like the Spring Course, their object will be to anticipate subjects presented during the Winter Session. *The Regular Winter Course* commences Monday, November 6th, and closes on the last day of February ensuing. Three hours of each day will be devoted to attendance upon lectures, which will be illustrated to the fullest extent by a large and valuable collection of Chemical and Philosophical apparatus, and Anatomical and Pathological specimens. Tickets for the Course, including the Demonstrators', \$100; Diploma, \$30; Matriculation (paid but once), \$5. For further particulars address

J. H. McQUILLEN, Dean, S. W. Cor. 21st and Arch Sts.

NEW PATENT ATMOSPHERIC DISK.



FOR HOLDING ARTIFICIAL TEETH FIRMLY IN PLACE

In Eating, Talking, Laughing, Singing, Coughing or Sneezing.

The undersigned offers to the dental profession this new and valuable device for retaining base plates securely in the mouth. Its utility has been demonstrated in over five hundred cases in my own practice. I believe it must come into general use, as no patient will dispense with it after a trial of its advantages. The Patent bears date of January 24, 1871, with seventeen years to run. Office, Town, County, or State rights for sale. Those desiring to test the disks practically before purchasing, can secure the necessary materials, ready for use, for six cases, with full instructions, by sending P. O. Money Order for three dollars.

Office rights for the full term.....	\$40 00
“ “ “ one year	10 00

Those purchasing rights for one year will be given rights for the balance of the term for \$30 more, if they choose to continue after the year has expired.

Address

DR. QUINCY A. SCOTT,

Lock Box 1,015, Pittsburgh, Pa.

DR. I. W. LYON'S TOOTH TABLETS.



NOTICE—CHANGE OF BOX.

I have dispensed with the pasteboard box formerly used in putting up the TABLETS, in consequence of its liability to breakage, and have substituted a SEAMLESS METALLIC BOX, which is impervious to air and moisture, and may be carried on a journey without danger of breaking, thereby preserving the TABLETS perfectly.

Confident that the change will be duly appreciated by the patrons of LYON'S TOOTH TABLETS, I am, respectfully,

I. W. LYON, D.D.S., Proprietor,

36 Vesey Street, New York.

SOLD BY DRUGGISTS AND DENTISTS GENERALLY, AND AT THE DENTAL DEPOTS.

Gaylord's Pneumatic Mallet.



The principle on which this mallet is constructed is doubtless *the* one to which we must look for the *perfect* automatic mallet.

The hammer, which is a cylinder of steel weighing about $\frac{1}{5}$ oz., is propelled through an air chamber in the hand piece, by a column of air actuated either by a rubber bulb or an air pump, and as it falls upon the head of the plugger point, gives a blow very closely resembling that of a hand mallet. This blow, in this instrument, is completely under the control of the operator;—he can strike one blow only, or a hundred in rapid succession. He can make it so light that it can barely be felt, or so severe as to be unendurable. This mallet is offered in two forms.

No. 1 consists of a rubber bulb, flattened on one side to rest on the floor, a long air-tight flexible tube, covered with silk externally, and supported internally by a coil of wire, in order to prevent the possibility of a collapse or of kinking, and a finely plated octagonal hand-piece, which is adapted to the Snow & Lewis points, but on order can be changed to take any of the points in ordinary use. Price.....\$22.50.

No. 2 is shown in the cut. It has the same construction as No. 1, and in addition an air pump supported by a japanned iron frame, and actuated by a treadle. This is a most convenient form. Price.....\$28.00

No. 3 same, except with power hand-piece to be run by any motor. Price...\$35.00

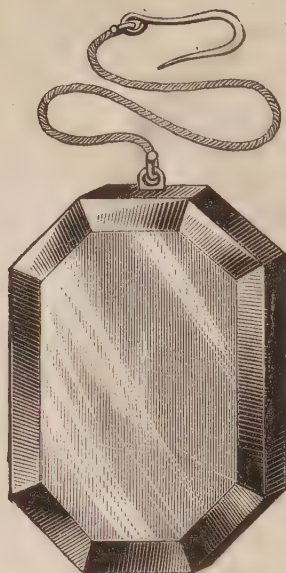
JOHNSTON BROS.,

812 Broadway, N. Y.

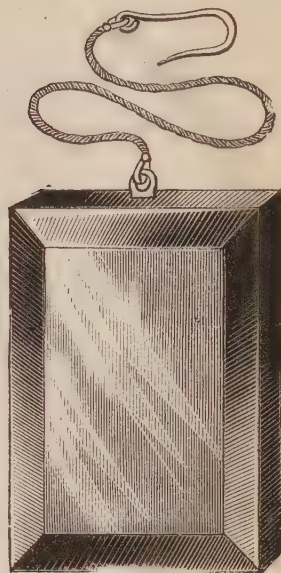
RUBBER DAM WEIGHTS.



No. 1.—1½ Oz.



No. 2.—2¼ Oz.



No. 3.—2½ Oz.

These are made of metal, and are nickel plated. They are a decided convenience to one using rubber dam—as by attaching them to the free edges of the rubber, these edges are kept out of the way of the operator and from annoying the patient.

Price, single.....40 cents; per set, \$1.00.

JOHNSTON BROS.,
812 Broadway, N. Y.

RUBBER DAM.

Invention of Dr. S. C. BARNUM.

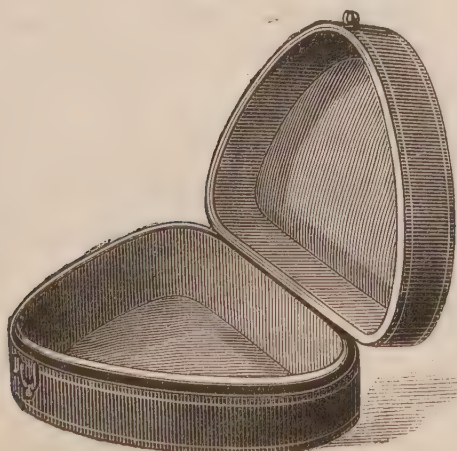
We constantly keep in stock an excellent quality of this article, now a necessity in Dental practice. This we offer in large or small quantity.

PRICES:—Thin, per yard.....\$2.50.
Medium, per yard..... 3.00.
Thick, “ “ 3.50.

A liberal discount to the trade.

JOHNSTON BROTHERS,
812 Broadway, N. Y.

TOOTH CASES.



Morocco, half oval, lined with cotton velvet, each.....\$ 35
Morocco, half oval, lined with cotton velvet, per dozen..... 3 60
Morocco, half oval, brass hinges and silk lined top, each..... 60
Morocco, half oval, brass hinges and silk lined top, each per dozen.... 6 00

JOHNSTON BROS.,
812 Broadway, N. Y.

RUBBER DAM CLAMP FORCEPS.

Of these we offer two styles, both deservedly popular.

DR.

G. A. BOWMAN'S

Rubber Dam

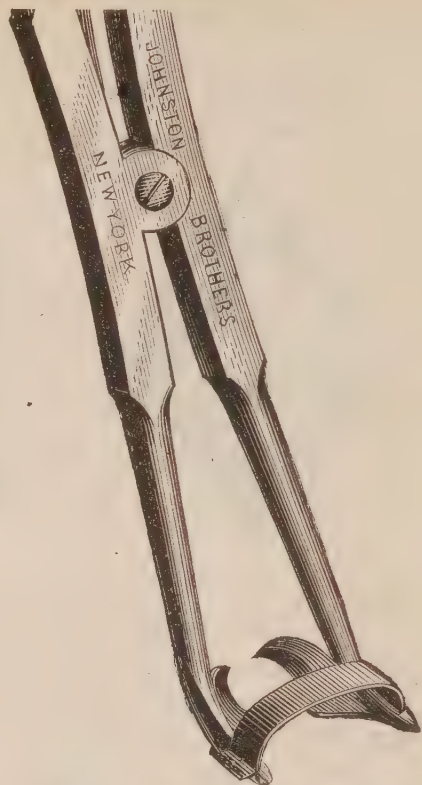
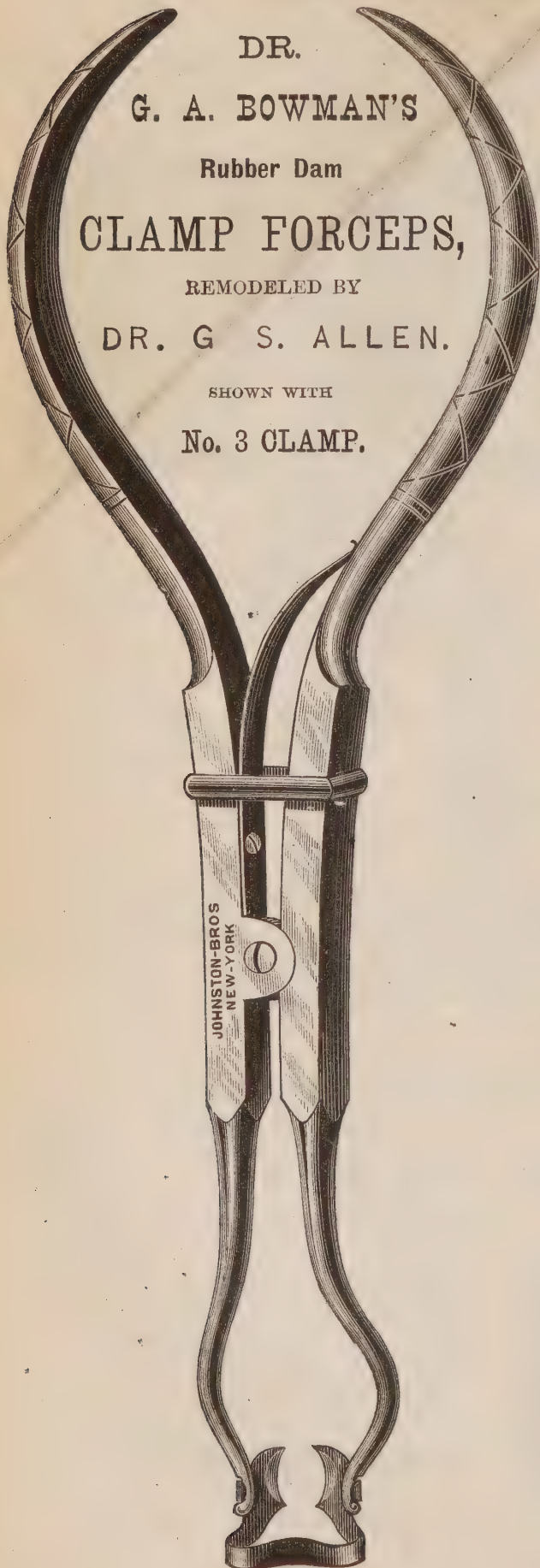
CLAMP FORCEPS,

REMODELED BY

DR. G. S. ALLEN.

SHOWN WITH

No. 3 CLAMP.



POINTS OF DR. T. C. ROYCE'S Rubber Dam Clamp Forceps,

Shown with Clamp. Handles are exactly like the other style, (Bowman's.)

Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

If so ordered we can supply either style of Forceps with a band, which will keep the Forceps and Clamp extended and ready for use when the hand of the operator is removed, as shown on the Bowman Forceps.

PRICES.

Forceps, either style	\$3.00
“ “ “ Nickel Plated....	3.50
Complete set of Clamps, embracing eight forms.....	4.00
Complete set of Clamps, embracing eight forms, plated.....	4.80
Clamps, each.....	50
“ plated.....	60

JOHNSTON BROS.

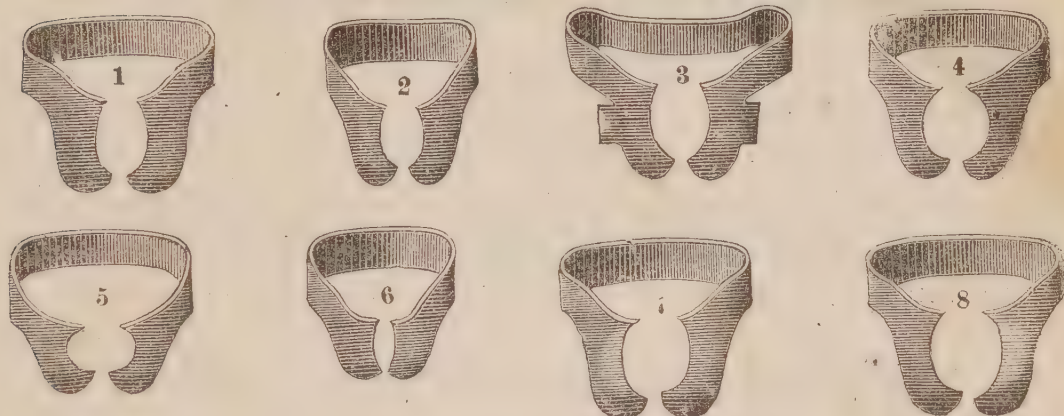
We were never more sure of doing signal service to the
Dental Profession than now in offering the

IMPROVED

Rubber Dam Clamps,

INVENTION OF

DR. DELOS PALMER, OF NEW YORK.



Price, set of Eight, { Oil finish, \$4.00. Each plain, 50 Cents
 { Nickel plated, 4.80. " Nickeled, 60

For use with Rubber Dam Clamp Forceps.

These Clamps are designed to be placed on the tooth at the commencement of the operation. Afterwards apply the Rubber Dam by passing it over both tooth and clamp.

DESCRIPTION.

Nos. 1 and 2.—Universal Clamp for Molars.

No. 3.—For posterior cavities in molars standing alone.

No. 4.—For third molars, or any molar of a cone shape. This Clamp can oftentimes be turned around while on the tooth, so as to place the bow of the Clamp out of the way of the operator.

No. 5.—For bicuspid.

No. 6.—For lateral and central incisors.

Nos. 7 and 8.—RIGHTS AND LEFTS.—For cavities under the gum, on the buccal or lingual surface of molars.

Cuts of two favorite styles of Rubber Dam Clamp Forceps will be found on another page.

These Clamps have prominent points of marked superiority over those of other manufacturers.

First. Each has been carefully adapted to the shape of the tooth for which it is designed, *under the personal supervision of Dr. Delos Palmer*, the inventor.

Second. A groove is made by us in the clamp, into which the forceps nicely fit, so that the clamps firmly hold their position on the forceps, when once adjusted, instead of tilting from one position to another—as is the case when no groove is provided.

JOHNSTON BROS.

OS ARTIFICIAL.

We have recently received a fresh invoice of this excellent white filling and are prepared to fill orders for it promptly.

Price, per ounce box.....\$1.00

JOHNSTON BROS.,

812 Broadway, New York.

Liberal Discount to the Trade.

DIAMOND AMALGAM.

Having purchased the *formula* and the *exclusive right to manufacture* the “Diamond” Amalgam, we now offer it to the profession and to the trade. It has become too well and favorably known to require extended notice.

PRICES.

Per 1 oz. in box, with pure mercury.....	\$4 00
Per ½ oz. “ “ “ “	2 25
Per oz. in envelope, without mercury.....	3 80
Per ½ oz. “ “ “	2 00

JOHNSTON BROS.,

812 Broadway, New York.

Liberal Discount to the Trade.

AMALGAMS

CONSTANTLY IN STOCK.

Diamond, in boxes.....	\$4 00
“ in envelopes.....	3 80
Lawrence's.....	3 00
Arrington's.....	4 00
Sterling.....	3 00
Star.....	4 00
Townsend's.....	2 00
Extra.....	4 00
Hood & Reynold's.....	5 00
Fletcher's, Gold.....	4 80
Walker's.....	4 00

JOHNSTON BROS.,

812 Broadway, New York.

Liberal Discount to the Trade.

FOR SALE.

A first-class dental practice in a good county-seat town in Wisconsin.
Good climate. A rare chance. For address inquire of

JOHNSTON BROS.,

812 Broadway, New York.

DENTAL MISCELLANY.

Bound Volumes—Complete Set.

WE WILL SUPPLY

Vol. 1, 1874, Handsomely Bound in Cloth, for.....	\$3.25
Or with Morocco Back and Corners for.....	\$4.00
Vol. 2, 1875, Handsomely Bound in Cloth, for.....	\$3.00
Or with Morocco Back and Corners for.....	\$4.00
Both Volumes Bound in Cloth.....	\$5.50

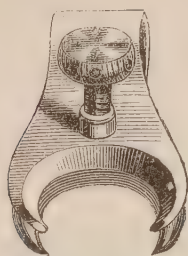
We will bind the MISCELLANY for 1875 handsomely in cloth for 50 cents per volume, or with morocco back and corners, \$1.25. Or we will send you by mail a cloth cover, properly stamped, lettered, &c., for the DENTAL MISCELLANY, on receipt of 30 cents for each cover wanted. Any book-binder will attach it for a few cents.

JOHNSTON BROS.,

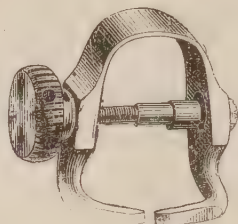
812 Broadway, New York.

Jarvis' Separators.

(PATENTED SEPT. 8, 1874.)



No. 1.



No. 4.

The cuts above shown are full size, and represent an apparatus for separating teeth. It is almost impossible to overstate the value and convenience of the devices. By their use, without delay to the operator or appreciable pain to the patient, adjacent teeth may be forced apart for any of the various purposes for which it has been customary to wedge teeth. Crowded teeth can be readily parted by using the separators, so that rubber dam can be applied without difficulty or loss of time. Two forms are shown by the cuts; of the first form we make three sizes, **No. 1, No. 2, and No. 3.**

The Separator consists of a piece of steel, nickel-plated, bent upon itself, having the two ends formed to fit the outer portions of the proximate surfaces of two adjoining crowns.

These jaws are forced apart by the action of a screw, which passes through one and against the other of them. This form is applicable to all the bicuspid and molars. It does not touch the gums or injure the teeth, neither does it cause pain sufficient to be of consequence. The whole instrument is drawn to a spring temper. The jaws are thin, in order to be out of the way, and also the more perfectly to adapt themselves to the surfaces of the crowns of the teeth than if they were rigid. The appliance may be left on, in many cases, while operating, or if removed the space gained by its use may be retained by inserting a wooden wedge.

The Compound Wedge, No. 4, consists of two wedges approaching or passing each other. This is especially applicable to the incisor teeth, and will be found particularly useful in making room for passing rubber dam around crowded teeth. In use, a small strip of wood should be placed over the teeth and beneath the cross-bar, to prevent the points from sliding towards the gum.

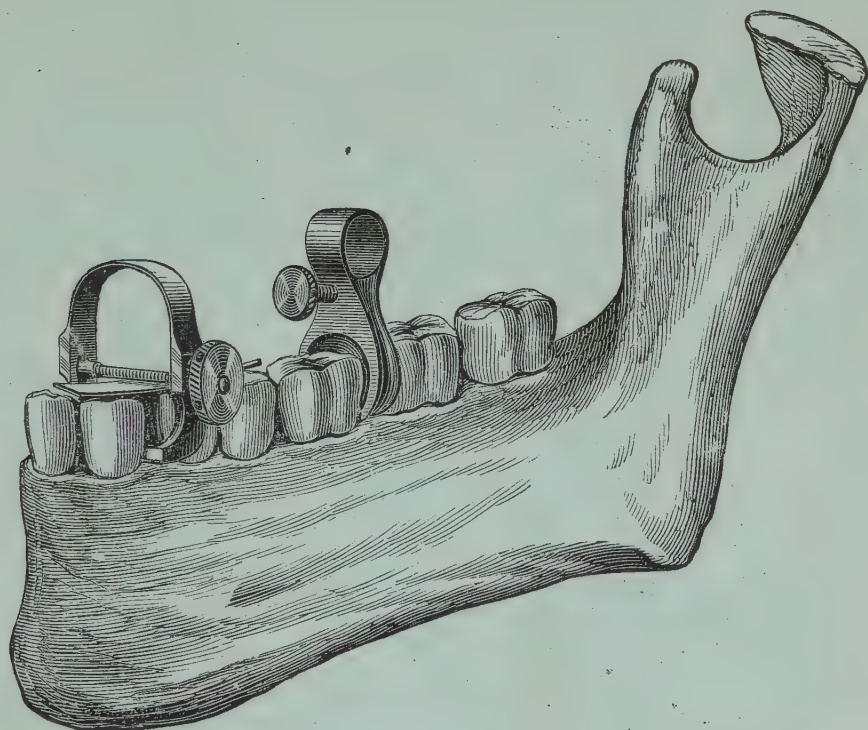
PRICES.

Complete Set of Four	\$6.00
Any Single Instrument.....	2.00

JOHNSTON BROS.,
812 Broadway, N. Y.

Jarvis' Separators in use.

(See Opposite Page.)



WOOD POLISHING POINTS



For Use in Engines.

PRICES.

Box of 100 Points, assorted shapes	\$1 25
Holders, each	30
“ “ Plated	40

Dental Depots supplied at manufacturers' prices.

JOHNSTON BROS.,

812 Broadway, N. Y.

—1876—

JOHNSTONS' Dental Miscellany,

A NEW MONTHLY JOURNAL

OF

AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.

ITS CONTRIBUTORS ARE EMINENT WRITERS AND PRACTITIONERS.

It will contain Prize Essays upon the important improvements of the day.

It will contain illustrated articles from DR. NORMAN W. KINGSLEY, on the Treatment of Cleft Palate, Deformities of the Mouth, Regulating of Teeth, &c.

The commendation of the Miscellany received during the last year has gratified its publishers greatly. They purpose to make the volume for 1876 superior in all respects to either volume that has preceded it. This will be—

1st. Through more frequent contributions from the regular writers who have hitherto favored it, and by promised essays from equally capable practitioners, who have not as yet written for its pages.

2d. By the further reproduction of engravings upon dental subjects. Three such have already appeared, and others are in course of preparation.

3d. By the constant search for, and publication of items of office practice, which serve to show the methods adopted by eminent and experienced dentists to overcome the little perplexities of every-day practice, and to shorten the operations in both laboratory and operating room.

In short, it shall be the constant effort of the editor and publishers to make the Dental Miscellany of practical value to every actively employed dentist, as well as a source of literary enjoyment to its scientific readers.

TERMS OF SUBSCRIPTION—IN ADVANCE.

One Copy, one Year, postage prepaid.....	\$2.50
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One-half ounce of "Premium" Gutta Percha Stopping, . . . value \$2 50

SPECIMEN COPIES SENT FREE.

JOHNSTON BROTHERS, Publishers,

812 BROADWAY, NEW YORK.

VOL. 3.



No. 27.

Johnstons'

Dental Miscellany,

A MONTHLY JOURNAL OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

MARCH, 1876.

NEW YORK :
JOHNSTON BROTHERS,
812 BROADWAY.

JOHNSTON'S DENTAL MISCELLANY,

FOR 1873.

It is certainly reasonable cause of self-congratulation on the part of the publishers of this Journal, that the end of the first year of its publication finds it with a large and constantly increasing list of subscribers, and that they are constantly in receipt of letters of encouragement and commendation from their readers in every section of the country, and even from distant portions of the world, one such letter being recently received from Japan.

We are promised one or more articles from each of the following gentlemen of established reputation, and others of like standing in the profession have encouraged the expectation of like favors from them.

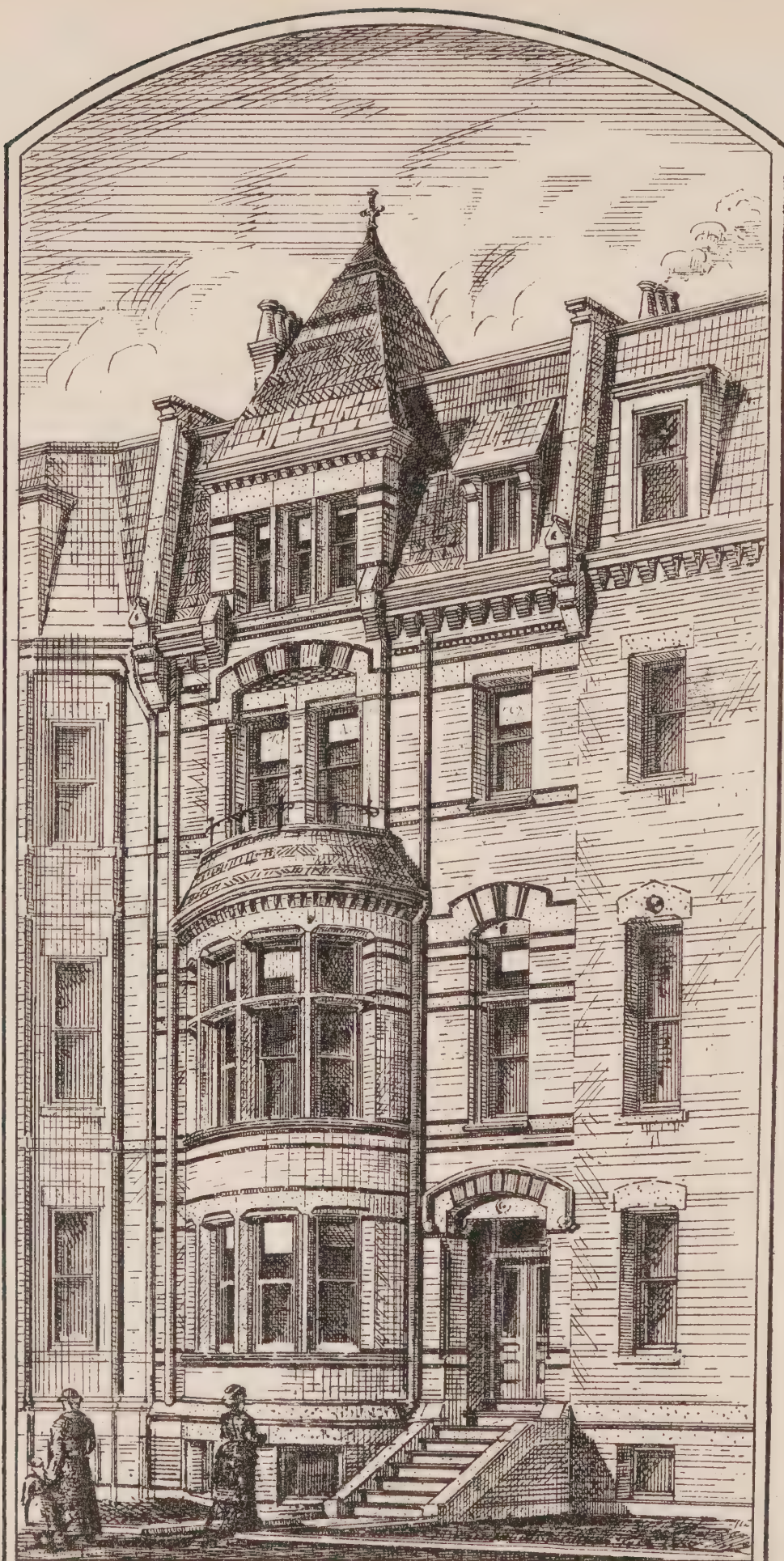
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Dr. W. H. DWINELLE, New York.
Dr. A. C. CASTLE, New York.

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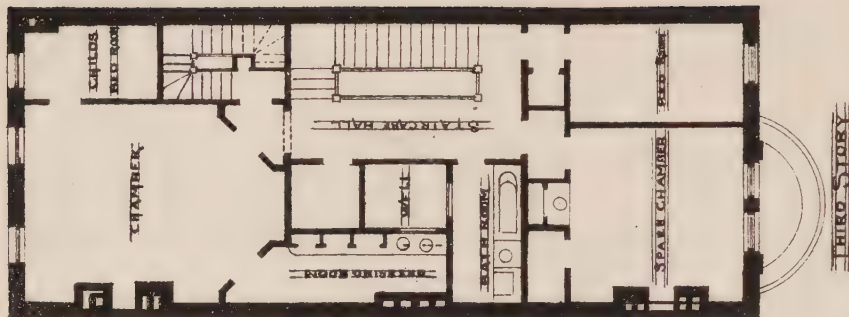
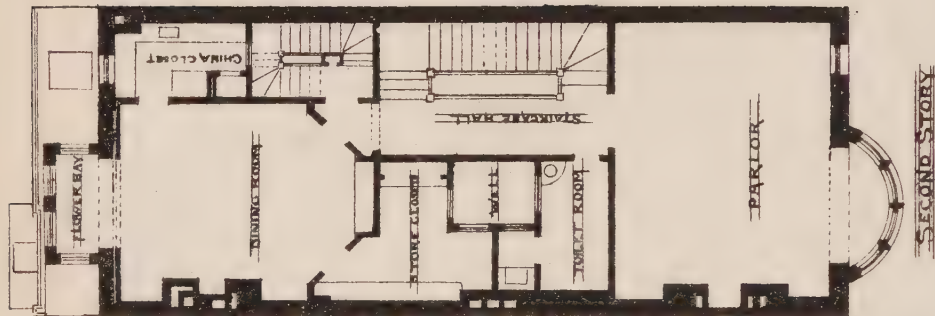
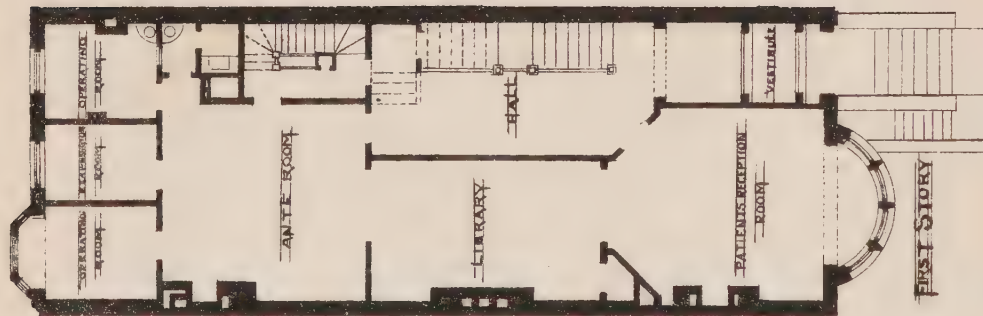
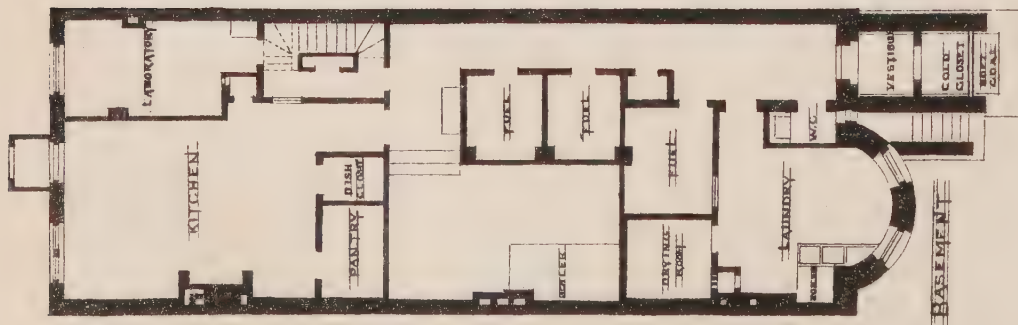
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HOUSE FOR DR. G.T. MOFFATT

HOY-LETON ST.

W. WHITNEY LEWIS
ARCHT.



DWELLING HOUSE

FOR DR. G. I. MOFFATT

W. H. DIXON LEWIS

ARCHITECT

JOHNSTONS'
Dental Miscellany.

VOL. III.—*MARCH*, 1876.—No. 27.

PROFESSIONAL ARCHITECTURE.

By GEO. T. MOFFATT, M.D., D.M.D. Boston.

The important subject of professional architecture has been but rarely alluded to in our professional literature. I know of but one instance, where plans and descriptions of a professional house have been published in any of our magazines, that by Dr. W. N. Morrison in the *Missouri Journal* for July, 1873. I know of no subject of more importance to the Dental Practitioner than a convenient and well-arranged house, which shall combine the needs of his business and the comfort of his family at the same time. So many considerations arise to make this arrangement comfortable and practicable that it seems to me we should devote more attention to the matter than is at present given to it. I propose to give as a contribution to this subject, plans and descriptions of a house I am just completing, hoping it will bring out the experience and practice of many others upon this important matter. I have had the experience of living in the same house with my office, and for nearly five years past of having the office by itself and living at a distance from it. In the plans I present I propose again to combine the two.

My plan is in substance the same as Dr. Morrison's, viz.: To have the business confined to one floor, the first floor from the street, and the family rooms all above, with the exception of kitchen, laundry, etc., which are in the basement.

The house has a frontage of 24 feet, and is 60 feet deep, for the main house, with 5 feet projection in the rear on the basement and first story. This projection gives opportunity for top lights, in the operating rooms. The elevation of the house is three stories, above basement, and a French roof, the latter so constructed as to give *clear rooms* with abund-

ant air space above. The basement in front allows of windows in the laundry, and in the rear is on a level with the yard.

By referring to the plan it will be seen that the basement has communication with the sidewalk by a flight of steps, beside of and underneath the front steps. On this floor are a laundry and drying-room, the kitchen, pantry, etc., and laboratory. The heating apparatus and fuel bins are in the centre of the basement, and sunk two feet lower than the floor level. A door from the kitchen communicates with the back yard and gate in the rear. On the first story in front is the patient's reception room, opening from the main hall; from this room through the library—lighted from the well overhead—access is had to the ante-room, from which open the operating rooms, three in number. A patient's toilette opens from the ante-room, and a dumb-waiter and speaking-tube communicate with the laboratory below. Two of the operating-rooms have top-lights, one of them in a projecting bay window, and the other by a direct light in the roof of the extension. A few words upon the exposure as regards sunlight. Dr. Morrison chose a northern exposure for his operating rooms. I have chosen a *southern*. This I have done for *sanitary* reasons. After an experience of five years with a northern exposure, without a ray of direct sunshine in my operating-room, I feel as if I had been working in a tomb. I believe that, confined as the dentist is, the direct rays of the sun in the operating room are absolutely necessary to health. This is not my experience *alone*, but is a deduction from *facts* that I have collated during the past three or four years from the experience of others.

Three things have had particular attention in this house, namely: sunlight, pure air, and thorough ventilation. Every room, however small, has both top and bottom ventilation. In rooms which have open fireplaces (of which there are seven), these answer for the bottom ventilators. Where there are *no* open fireplaces, direct communication is had by tin pipes and flues with ventilators upon the roof. The well through the centre of the house gives light to all the bathrooms, dressing-rooms, and closets, so that there are no *dark* rooms. The main ventilating shaft from the basement and the operating-rooms, runs up beside the flue from the kitchen range, thereby insuring a constant upward draft. The back stairs give easy access to the laboratory below, without having to pass through the kitchen or other rooms in the basement. The second floor has parlor, dining-room, with large flower bay, china closet, with dumb waiter from the kitchen, store-room or pantry and toilette room.

The third story has four chambers, with bath-room, dressing-room, and linen closet. The fourth story is arranged nearly like the third.

A plan of this story is not given in the illustrations, for want of space.

The house is heated by steam, but entirely by indirect radiation. The radiators, four in number, are in the basement, all having a supply of cold air from out of doors, which, passing over the hot steam pipe, is carried to each room through tin pipes and registers like an ordinary furnace. This arrangement secures a supply of fresh pure air that cannot be overheated or contaminated by admixture with deleterious gases.

The house was planned by and constructed under the supervision of Mr. Wm. Whitney Lewis, of Boston, who has endeavored to make as nearly as possible, a model professional house.

OUR LONDON LETTER.

LONDON, January 17th, 1876.

MR. EDITOR: — Massachusetts watches are being pushed with great vigor in this country. Do you think they are going ahead a bit, and running old time out of breath in this ancient community? Editors are supposed to know everything. Is it the American watches, or do you think that Anno Domini has something to do with it? You know how often we have been warned of the time coming when the steeds of Phœbus would require no whip. Has that time really come? The days and months seem now to mock us in their swiftness. The present is never with us. It seems to become the past before we have realized its existence. Have we come to the period, when “the path of life slopes downwards”? Ah, well, perhaps we have! Let us be thankful we have got so far and so well, and try to remember that life is still a path which must be trodden, and that the “down track” has its duties as well as the upward one.

Dental events have been moving slowly here since I last wrote to you. Dental reform—that ever to be, never to be consummated work (what work is final?)—has made some silent progress. A powerful committee has been nominated and will speedily be elected. Then the real hard work will begin, to be met, no doubt, with much opposition; but, sir, opposition you know is a stimulus to action, and I trust the committee will prove equal to the task devolving on it. The Odonto-

logical Society opens its February meeting under a new president — Mr. Tomes's year of office having expired. The year has been a successful one, and from the number of new members balloted for at the last meeting, and the number of gentlemen nominated for membership — 18 in all, I believe—the new year promises well. The new president is Mr. Charles Vasey, Lecturer on Dental Surgery at the medical school attached to St. George's Hospital. He is well and favorably known to many of your countrymen who have favored us with a visit, and they will no doubt be pleased to learn through your columns (of course they all subscribe to your Journal) that such a high honor has been conferred upon him.

Looking a little further from home, I see that the European Society of American Dentists has been holding a session in the midst of much gaiety and beauty, and that the smiles of friends at home and the criticisms of Vagrant are looked upon with rather more forbearance than previously. Although I am not a friend at home, I still claim to be a friend abroad, whatever others may think or say, and I hope with all my heart that every annual gathering may be more and more interesting; but I cannot see how the discussion of a few questions which have often been discussed before, and the "interchange of photographs," are likely to raise the standard of Dentistry in one of the four quarters of the globe, even to the position which it occupies in America. I could not help remarking how fortunate it was that a well-known gentleman from New York was present at one of the meetings, to insist on the discussion of a question being confined to a scientific basis, rather than admitting conclusions drawn from the personal observation of one or two of the members.

There is at present an American dentist practicing in a fashionable winter resort in the south of France, who advertises his price-list for different kinds of work in every department, and gives two different addresses in America. I venture to suggest that this gentleman's professional ideas require enlightening, and that such an ubiquitous individual might be a good subject for elevation.

I see that the editor of the *Monthly Review of Dental Surgery* has fallen foul of an energetic gentleman in New York, who has been making use of the press of your city and the names of sundry gentlemen at home and abroad, in order to gain a spurious, and, let us hope, an evanescent notoriety. I have been looking in the various journals for an account of what was promised to be "one of the most interesting and instructive dental meetings which has been held during the year,"

but have failed—perhaps through the remissness of the reporters—from getting even a few crumbs from the promised banquet. I see, however, that the “American Academy of Dental Surgery” has had a meeting, at which an interesting paper was read, but what it was about the reporter has neglected to inform us. Was it too interesting to be appreciated by the unfortunates out of the charmed circle of the Academy? Perhaps the editor of the *Monthly Review*, already alluded to, has been disappointed in his expectations, as well as your humble servant, for he has made a most merciless exposé of this “Academy” and the proceedings of its president; but, unfortunately for the editor, he has prefixed his account of the matter with an exposition of advertising generally and also with his views on professional advertising, and comes to the conclusion in the refrain of the old song:

“So very much depends upon the way in which it’s done.”

The vulgar will be vulgar and the educated man will be gentlemanly in his methods, but the “aim and object” of each is the same, to “acquire fame,” and “all professional men in a certain sense advertise.”

Now, sir, I should indeed be sorry if this rash article be taken by any of your readers as the standard of professional ethics in this country, any more than we here believe that the “*honors* and emoluments” of Dentistry are “within the reach of any man who has ambition enough to raise himself above the position of a daily laborer.” (*Pennsylvania Journal*, December, p. 470.) The editor’s view may account for much of the trashy literature with which all professions are flooded, but I think he attributes most unworthy motives to many of the most eminent men in all professions. To begin with his quotation of the remark of Lord Byron that he “woke up one morning and found himself famous,” is unfortunate, for if ever a man cared little about being famous or infamous, Lord Byron was he. The remark seems to show me that instead of having “hit upon a ready means,” he neither expected nor courted the attention of the world. Lord Byron, along with others of his class, along with all original thinkers and original workers, acted under the impulse which was within him, a feeling which does not want to calculate results either in wealth or notoriety, and I cannot help wondering at the mental obliquity of a man who thinks that “Childe Harold” was written under the impulse of a desire for fame. Such an assertion takes away one’s power of argument, and makes one forget to talk of the inferior mortals called professional men who are assailed by the editor. He seems to forget that there are sensitive and

retiring men of ability in existence, who have in a manner to be forced out of their retirement, and who shrink from publicity because of a fear of fame. He either forgets or does not know that there is such a thing as culture which teaches a man not to expect too much in this world, and the possession of which cannot be relied upon to bring prosperity, but is often a foe to it in the vulgar (and I fear in this instance, editorial) sense. A culture which keeps its possessor from too great a reliance on the creations of his own or any other man's brains, and from a supreme belief in his own cunning—qualities most essential to the advertiser. He sets aside public spirit and enthusiasm, or the restless daring in the cause of humanity and science which carried Livingstone to the torrid, and Captain Hall to the frigid zone to die. Surely these men had done enough for notoriety before their last fatal ventures. And so I might go back through the long pages of history if the question required arguing. But I think, sir, that there are few of your readers who could not point out men who toil in obscurity for the advancement of our own and kindred professions, and others long past the zenith of life, who having reaped a full harvest of honor still come forward at the call of duty to bear the burden and heat of the day.

I cannot help speaking and feeling strongly on this article, as every man among us who moves from his operating chair, who receives any public appointment, or who evinces any public spirit whatever lies under the vulgar imputation of advertising himself.

The writer of the article is evidently a worshiper at the shrine of "getting on," and sees everybody through the murky halo of his own incense.

I see with regret that a notice of Vernon Galbray, in the *Cosmos* for November, has caused the author to declare himself. He is a most retiring, unobtrusive gentleman, and would not have done so without great provocation. This, I regret to say, was afforded by the notice in question, in which the book is set down as an advertisement of a well known dental depot. The not very polite language of "set a thief to catch a thief" is used in placing this matter before the reader—of course one might carry his ideas backwards, and include the discoverer of the secret, but that is evidently the meaning of the writer, and so Mr. Weiss acknowledges the authorship, and Messrs. Ash & Son repudiate any knowledge whatever of the publication of the book. It must be a matter of regret to all of us that the business of our depots cannot be carried on without the exhibition of such decided bad taste—to use a mild expression. There seems to be room enough for all. It is absurd

for any one firm to expect a monopoly, and I think it would be a sad day for us poor practitioners if ever such a time came. I have a vivid recollection of the founder of the firm in question, and readily believe the paragraph alluded to. The old gentleman was most particular in his dealings, and if there be any deviation from his lines, which I have no reason to believe, we must thank competition for it, as it is not an unmitigated blessing at any time. The name of the author of the little book has been before the public before, and all who know the beautiful music to which Longfellow's "Village Blacksmith" is sung, have to thank the brothers of the author of "Vernon Galbray" for that pleasure. I cannot close without alluding with pleasure to the steps which General Schenck has taken to enlighten the too credulous British public on the bogus degrees offered for sale by the professed agents of the Philadelphia University of Medicine and Surgery, and the Livingstone University of America. He has published a correspondence on the subject which proves the non-existence of such institutions, and that one such institution, the Philadelphia University or American College of Medicine, had its charter revoked for the issue of diplomas to unqualified people.

VAGRANT.

EXTRACT FROM THE REPORT OF PRESIDENT ELIOT OF HARVARD COLLEGE FOR 1875.

The following extracts were written particularly of the advanced requirements in the way of preparatory study, demanded of applicants for admission to Harvard's Professional Department. The Dental College is elsewhere mentioned as taking the same advanced views, and has made corresponding advance in its requirements for admission. President Eliot's remarks are founded on extensive observation and experience. They are thoroughly in accord with the general sentiment of literary and professional men who have given most attention to educational interests in recent years, and we take pleasure in commending them to our readers.—ED.

The other important event in the history of the Law School, and it may be hoped in the history of legal education in the United States, was the establishment of an admission examination applicable from and after the beginning of the Academic year 1877-'78, to all candi-

dates for the degree of the school who are not already Bachelors of Arts, Science, or Philosophy. Similar action was taken almost simultaneously by the Medical Faculty, although the particular requisitions were not identical with those determined upon by the Law Faculty. Indeed, the precise nature of the new requisitions for admission to these professional schools is not material ; for the requisitions now made will probably undergo a gradual and progressive change. The important fact is, that the University proposes to demand of all candidates for its degree of Bachelor of Laws, or Doctor of Medicine, evidence of some academic training, not so much for the sake of the knowledge which that training imparts, as of the mental power which it develops. The University, in taking this action, is only doing its duty to the learned professions of Law and Medicine, which have been for fifty years in process of degradation through the barbarous practice of admitting to them persons wholly destitute of academic culture. The professional departments of the University are by this action only beginning to lend a due support to the College and the preparatory schools a support which they should always have given, and which in every other civilized country is given to academic institutions by the regulations and usages which govern admission to the learned professions. The schools of Law and Medicine which have sprung up all over the country during the last forty years have held no examinations for admission, and have required of candidates for admission no particular course of previous study. Had they demanded a reasonable amount of academic training, most of them could have procured it from a large proportion, at least, of their pupils. It is not the young men of the country, or their parents, who are responsible for the present degraded state of professional education, but the Faculties and Governors of the modern American professional schools, who having but feeble faith in the value of academic training, or being afraid of diminishing the number of their pupils, failed to demand of candidates for admission an adequate general education. Thousands of ignorant, undisciplined men have consequently entered the legal and medical professions with the scantiest technical preparation, to their own lasting injury and that of the community, who would have found means to get some academic training, had any been required of them. In the meantime the High Schools, Academies and Colleges of this country have been deprived of the legitimate support which in every other civilized country they derive from the fact that only through them can the learned professions be reached.

As one consequence, the number of young men who resort to Colleges has diminished relatively to population during the past forty years, instead of rising, as it should have done, with the increase of general well-being. So long as lectures were the one means of teaching in the Law and Medical Schools of this University, the heterogeneous character of the class did not much affect the efficiency of the instruction, except so far as the lecturers felt obliged to adapt their teaching to the ignorant and untrained portion of their audience. But with the adoption of catechetical methods in both schools, the presence in the recitation rooms of a considerable proportion of persons whose minds were rude and unformed became at once a serious impediment. The large use of examinations in writing also brought into plain sight the shocking illiteracy of a part of the students, and made the Faculties quite ashamed of some of their pupils. In the legal profession there are various walks recognized by statute or by ancient usage in some countries, but existing everywhere with more or less precision of definition. It should be the aim of a University's Law School to train young men of good preliminary education and average ability, taken by the hundred, for the higher walks of the profession. While steadily pursuing this main object, the school can incidentally render some other service; but it must watch that its legitimate function be not impaired. The Law and Medical Faculties have not failed to observe that some very exceptional persons succeed in life by force of great natural endowments, who had no early discipline or regular training of any sort; but they believe such persons succeed not because of, but in spite of, their early disadvantages, and that their cases afford no argument against the general utility of thorough training, both academic and professional, and no argument in favor of laxity in admitting to learned professions. Genius has seven-leagued boots, but common men require a well-made road.

It may be urged, however, as it was five years ago in the matter of the re-organization of the Medical School, that an admission examination to professional schools, though desirable, is impracticable; that it would reduce the income of the schools so much as seriously to impair the instruction in them, and so lessen their efficiency and their usefulness; and such an argument certainly deserves serious attention. In the case, however, of the Law School there need be no apprehension of such results; for there are at this moment in the school eighty-nine persons who have academic degrees; and if none but those who

hold such degrees should join the school next year, the income would still be sufficient to support the present organization for instruction without reduction. Of course a few persons not holding academic degrees would enter upon examination, and the exclusion of uneducated men would of itself increase the resort of educated persons to the school; but with no more than one hundred students next year the income from tuition fees would still be larger than in any year previous to 1871-'72.

Reliance should also be placed on a more general principle, which is of great encouragement to all who desire American institutions of high education to make large advances in thoroughness and strictness. An institution which has any real prestige and power will make a money profit by raising its standard, and that either at once or in a very short time. Its demand for greater attainments on the part of its students will be quickly responded to, and this improved class of students will, in a marvelously short time, so increase the reputation and influence of the institution as to make its privileges and its rewards more valued and more valuable. Of course improvements which involve longer residence on the part of students are the easiest for an institution to make, because longer residence means more fees from each student; but all reasonable measures of strictness, which it might be feared would reduce the amount of tuition fees, will actually increase them. Such measures are the requisition of an admission examination, or the increase of requisitions for admission; the lengthening of the required term of residence; the imposition of an examination for a degree; the conversion of oral examinations into examinations in writing; the imposition of examinations for passing from one year of a long course to the next year; the raising of the tuition fee; and the enforcement of rules to exact a minimum attainment. All such measures, if put into execution gradually and judiciously, and accompanied by corresponding improvements in methods of teaching and facilities for learning, will result, before long, in a money gain to the institution which adopts them.

The following statement of the receipts from students for several successive years in the Law School, Medical School and College, well illustrates the truth of the principle under consideration. In the Medical School, since 1870-'71, oral examinations have been converted into examinations in writing; the examination for the degree has been made much more severe; examinations have been established for passing

from one year of the course to another ; and the average residence has been lengthened, so that the cost of getting the degree of the school has been considerably increased. These severe measures were enforced so rapidly that not a few well-informed persons thought that the school would be killed outright. In the Law School, within five years, a strict examination in writing for the degree has been imposed, where there was none before ; the regular period of residence required for the degree has been made two years instead of eighteen months ; examinations have been established for passing from one year of the course to the next ; the tuition fee has been raised, and the whole tone of the school changed from laxity to strictness. The College is well known to have steadily increased its demands upon its students during the past ten years ; the tuition fee has been raised, and it has been steadily growing harder to get into the College, harder to stay in it, and harder to obtain its degree. The following figures may well be considered very encouraging to friends of sound education, for they prove that such substantial improvements in education as those above described, so far from being in advance of the demand, are really welcomed. The figures represent the amount of the tuition fees in each year, except that in the case of the Medical School, a small proportion of other receipts, like the matriculation and graduation fees, is included.

Year.	Tuition fees in the Law School.	Receipts from Students in the Medical School.	Tuition fees in the College.
1865-66	\$14,704.75	Accounts of the School not kept by the Treasurer of Harvard College until 1871-72.	\$33,147.66
1866-67	13,035.00		33,606.50
1867-68	10,382.50		† 39,415.55
1868-69	11,527.50		43,629.55
1869-70	11,525.00		**82,462.95
1870-71	13,524.00		89,812.50
1871-72	*16,179.00		†24,104.59
1872-73	15,075.00		22,283.84
1873-74	16,975.00		31,114.97
1874-75	17,700.00		104,184.97
			102,884.78

* Fee of the first year raised from \$100 to \$150.

† First year of the new organization.

‡ In these years add 10 per cent. for fees then separately charged, but since included in the tuition fee.

** Fee raised from \$104 to \$150.

FIRST JUDICIAL DISTRICT DENTAL SOCIETY, S. N. Y.

MONDAY EVENING, DEC. 6TH, 1875.

The meeting was called to order at 8 P. M. President J. S. Latimer in the chair.

The minutes of the last meeting were read and approved.

Dr. Atkinson then read a paper upon the subject of the evening, viz: Iamatology, or Dental Materia Medica, and the action of some of the later dental remedies.

Dr. Brockway called attention to an error in reference to the preparation of chloral hydrate, and stated that the chloral and camphor were in equal proportions, and the salicylic acid was added afterwards, rubbing it into the chloral and camphor as much as it would take up.

The president stated that he had been using a pasty mass made with salicylic acid, and glycerine, and also another pasty mass, using a solution of salicylic acid in tincture of cloves, and that it was very successful.

Dr. John Allen stated that he had used salicylic acid with so much satisfaction that he had adopted it almost entirely in the treatment of diseased teeth before filling.

Dr. Dwinelle: I desire to say a word in praise of iodide of zinc. It is well known that all old remedies at times fail. Not only do our medicines have their idiosyncrasies, but our patients have theirs also, which must be ministered to; then physical systems differ. Now, by way of change, I find iodide of zinc a most excellent remedy in all cases where we are accustomed to resort to iodine or a combination of it. Without throwing aside iodine proper, or chloride of zinc proper, I find in combination that these remedies act differently—more favorably than either alone. In cases of recession of the gums from the teeth, inflammation induced by the removal of bi-tartar about the teeth, and all abnormal conditions of the gums, teeth and jaw, where there is excessive inflammation, throwing off of pus, and degenerated fluids, I find iodide of zinc excellent as a remedy. For instance, where the gums have assumed a flabby, relaxed and degenerated condition, losing their function as gums, and needing the stimulant of an astringent, and also the stimulating influence of the iodine, which we know does much toward promoting a healthy formative process, this combination is superior to anything I have used heretofore.

I merely rise to testify my approval of this remedy, and before resuming my seat, I beg leave to call upon Dr. Rich, who, I believe, has had considerable experience in this direction.

Dr. Rich : I have had very little experience in the use of this new remedy ; not sufficient to speak of it authoritatively. In the few cases in which I have employed it, however, it has operated better than any remedy I ever used for like purposes ; but my experience has been so limited that I can only endorse it to that extent.

I applied it once in a case of very sensitive dentine, and found it to operate with wonderfully good results. It was a case in which I had tried every ordinary remedy, the pain obtunda, and also a free application of the galvanic battery, passing a slight current through the cavity partly filled with water, without success. It was an application of only a few moments. It discolored the dentine somewhat, and some traces remained after it was washed out with warm water, but it was all removed with the excavator.

Dr. Dwinelle : An iodine stain is readily removed by aqua ammonia. In that way you can make a colorless iodide, by mixing it with ammonia in proportions of half and half.

Dr. Kingsley : I have nothing to bring forward which shall stop the discussion of Dr. Atkinson's valuable paper ; nevertheless, I suppose that the subject of that paper is one that may be taken up at any time, and there is another matter which may interest you, which I desire to introduce at this time.

For some time past, as you know, we have seen in all the dental journals, and heard at nearly every meeting of any dental society, more or less in reference to the status of the dental profession. And in reading what has been written upon that subject, and in listening to what has been said in public gatherings and in private conversation, there has seemed to me to be a sort of vague idea prevailing that the dental profession deserved to occupy, and really held, a position above that generally accorded to them. It has seemed to me particularly noticeable in all public dental gatherings. And we seem to have flattered ourselves with the idea that we were really something above what other people were willing to acknowledge us to be. It has not always been put in the plainest terms, but there has been a sort of under-current of such feeling.

And particularly has this been indulged in toward the medical profession. The idea that they were denying us some rights and privileges that we were entitled to, that there was a recognition denied us at their

hands which was our due. This claim has rarely been definitely put forward, and yet I have known of instances where the matter has been brought to a test ; as, for instance, a gentleman in good standing, holding the degree of M.D., never having violated in any sense the code of ethics, has applied to recognized bodies of medicine for admission—for instance, the Academy of Medicine, and, though regularly entitled to membership, has been refused; thus showing that there may be some ground for this feeling. I have taken, and still take, considerable interest in this matter of dental education, and especially in this discussion now going on in reference to dental colleges—whether they should exist as separate institutions, or be merged into the medical institutions. I have given the subject much thought, and recently, having heard by report that Professor Hamilton, whom we all know as a distinguished and representative member of the medical profession, held definite views upon this subject, and that he had addressed a body of dentists in this city, expressing those views, I asked him if he would kindly come and say to us to-night, not what he said there, unless he chose, but give us his views generally upon this subject. I said to him that a great many of us, as a profession, have felt that our rights were in a measure withheld from us, and that if he felt that we were fully accorded all that we deserve, I should be glad if he, a representative medical man, would state the grounds for that opinion.

For myself I must say that I have not had much sympathy with this restless anxiety for a recognition. I have felt that if we did our work honestly and skillfully, and that suffering humanity was benefited by it, it would not be a great while before humanity universally would recognize us, and, in any event, in individual cases, it would be but a short time before we are recognized by the Great Physician.

I have taken the liberty of inviting Dr. Hamilton to speak before us entirely on my own responsibility, and I will now close my remarks by making a motion that Dr. H. be invited to address you upon these subjects. (Carried.)

Dr. Hamilton : As you see, gentlemen, I have prepared some remarks to make to you this evening, but I say to you frankly that if I had known before I arrived that I should meet an assemblage of this size, and so many gentlemen who seem to be my peers both in education and experience, and if I had understood fully the questions which have suggested themselves to you, as noted by my friend, Dr. Kingsley, I should have preferred to withdraw this paper, for it does not seem to me that I have met, in the remarks I have jotted down, the

exigencies of the case ; but I fear it is too late now, and I shall be obliged to give them to you, although I consider them immaterial and scarcely appropriate.

You are not my pupils, many of you are my seniors, and you are better able to instruct me on these points than I am even to suggest to you.

In monarchical governments the arts and sciences look, in a great degree, for their elevation and support to royal and noble patronage. To be “perfumer in ordinary” to her Royal Highness or to the Duchess of Sutherland is to have achieved fame and fortune. In this country everything is done by association. Politicians and rogues combine to form “rings.” Men of letters club and dine together, and men of science organize associations and talk together. In this city there is not an evening during the week, except in the months of July and August, which is not occupied by some one of the numerous medical societies.

The rapid and surprising advance of dentistry in this country dates from the period only a few years back, when you “organized”—that is the term—your first dental association. First there was association; then dental journals; then dental colleges.

So our habits are moulded by the demands of our institutions. We have refused the paternal care of kings and of princes, and we have no hope or help left except in union. Like ants, we form ourselves into families, and then set to work, each man depositing his grain of sand; and then the habitation is speedily constructed.

Only a few evenings since I accepted an invitation to address an association of dentists; and I have cheerfully complied with a similar request from my friend Dr. Kingsley to meet and converse with you this evening. My only objection was, that I had said pretty much all I had to say upon this subject to the other gentlemen; but he disposed of this objection by saying that I might, if I chose, repeat what I said on that occasion. This was so generous and confiding—for he had very little idea what I had said—that I could no longer hesitate.

I propose, then, gentlemen, to speak of dentistry in a somewhat general way; that is, as seen from my own stand-point,—the stand-point of a physician and surgeon. What is dentistry? ‘The term, as employed to-day, includes mechanical dentistry and dental surgery.

1st. *Mechanical Dentistry* is the art of cleaning, filling, setting, adjusting, and extraction of teeth; and, if the operator chooses, he may make his art include, also, the manufacture of teeth.

It is scarcely proper to call one a dentist who only manufactures teeth, any more than it is proper to apply the term orthopædist to one who manufactures orthopædic apparatus, or the term ophthalmologist to one who makes lenses, or the term gynæcologist to one who constructs pessaries; but, if one both makes and sets teeth, he is a mechanical dentist. This would seem to be the natural and proper limitation of the term in one direction. On the other hand, the mechanical dentist is not necessarily or absolutely limited to what is purely mechanical. Such a rigorous and exact line of separation between cognate arts and sciences, or between closely-allied professions, or between specialties and departments of a profession, is scarcely possible, and is never insisted upon. The man who adjusts teeth, or who fills and cleans teeth, must be permitted to advise as to the manner of preserving teeth; and there are many minor surgical affections of the jaw in which his experience, position, and the adaptability of his instruments render him the safest adviser and the most skillful operator; for, after all, you understand, this constitutes the only proper guide in the division and distribution of the various departments of medicine and surgery,—not what is best for the doctor, but what is best for the patient. We have no right to distribute maladies; but it is their right to distribute themselves to whoever and whatever is most likely to cure them. It is evident, however, that there must be somewhere a natural limit to their sphere of usefulness. It must include its own atmosphere, but it must be careful not to encroach upon the atmosphere of other spheres, and simply because, out of its own atmosphere, it is pretty sure to grope in ignorance and in blindness.

You will observe how naturally the mechanical dentist comes to the relief of the surgeon, even in the treatment of certain examples of broken jaws, where such appliances are required as only an expert mechanic can make and adjust,—that is, a mechanic familiar with those tools and manipulations which are employed about the jaws. We understand perfectly that you can do this kind of work better than we can, and we hand it over to you as a part of your possessions; but, if we did not, it would go to you inevitably by that natural law of distribution to which I have already referred.

It does not follow, however, that you will manage any better than we do all fractures of the jaw. Indeed, I may be permitted to say that you will probably not manage most of them as well as we, since it is not to be supposed that you are so thoroughly grounded in the general principles which underlie the treatment of all fractures; you have not

had the broader experience of the general surgeon, and do not know so well the causes of delay in union, and many other matters relating to this subject, which come only of extensive reading and experience.

I have, then, attempted to define, according to my views, the term "mechanical dentistry." The definition is not complete; but, in this respect, it is in the same situation as all other specialties in our profession, between which and many others it is often impossible to draw sharply the lines of demarkation.

Mechanical dentistry is primarily and essentially an art,—a mechanical art and a fine art,—since it requires not only skill in the use of the hands, and in the manipulation of metals and various other compositions, but also judgment and taste in the adaptation of the teeth to the features of the face. The skillful dentist aims no less at æsthetic effect than at mechanical perfection and durability.

Mechanical dentistry is, I repeat, primarily and fundamentally an art. Art was the original crystal; but it has steadily grown since its first formation, by the addition of new discoveries in art, and by the gradual accretions of science.

It is a handicraft demanding, first of all, skill in the fingers; but it requires science for its completion. For this reason, it is easier to make a good mechanical dentist of an average jeweler than of an expert doctor. I have often seen the watchmaker transform himself into a dentist, and make a most excellent workman and a useful man; but it is very seldom, in my observation, that a man educated at first as a surgeon and physician has converted himself into a good mechanical dentist. It is an attempt to make the cone stand upon its apex instead of its base. The workshop and the laboratory make mechanical dentists, but medical colleges do not; and it seems to me absurd to suppose that they ever can.

2d. *Dental Surgery.* I have taken the liberty of assuming that the terms employed by me to designate the two important classes of dentists are appropriate. They have been occasionally employed in the same manner by dentists themselves, and they serve my purpose in the classification of the topics, and in the arrangement of the remarks which I am now making.

A dental surgeon is one who is qualified and authorized to practice not only most, or all, of mechanical dentistry, as the term has been defined by me, including, perhaps, much of the minor surgery of the jaws and possibly of the entire buccal cavity: he is one who feels himself competent to diagnosticate and remove all tumors occurring in this

anatomical region; to extirpate large portions of, or the entire maxillary bones; to overcome ankylosis; to operate for cleft palate, etc.

Between the mechanical dentist and the dental surgeon there is a pretty wide difference,—indeed, a much wider difference than between the general surgeon and the dental surgeon,—inasmuch as dental surgery is but a branch of general surgery, to which mechanical surgery has been added by way of supplement; while mechanical dentistry has no necessary relation to dental surgery, its connection being accidental, and only such as arises from proximity and association. To explain the matter as a grammarian, I would say, in the term “mechanical dentistry,” the word “dentistry” is the noun or the subject, and the word “mechanical” the qualifying adjective; while in the term “dental surgery,” “surgery” is the noun and “dental” the adjective.

I repeat, then, gentlemen, that dental surgery is a branch of general surgery; and whether it includes all varieties of mechanical surgery or not, its practice demands peculiar qualifications. It is just as much a department of general surgery and medicine as are ophthalmology, otology, gynæcology, lithotomy, etc., and demands of its practitioners precisely the same general qualifications. No one has ever thought that any man is properly prepared to practice in either of the departments above named until he has obtained that general knowledge of medicine and surgery which is implied in the degree of doctor in medicine, obtained after a regular course of studies and a thorough examination. I say after examination, because honorary degrees are occasionally conferred by our medical colleges, and always without examination. It is needless to say, therefore, that such degrees ought not to confer the right to practice.

A part of the human body cannot anatomically, physiologically, or therapeutically be separated from the whole. Here the greater always includes the lesser. If any one thinks differently, if he believes that he can know all that is to be known about the diseases of the jaw or face without a knowledge of the diseases of the whole body, he proves only that he has had but a limited experience in the subject, that he has given to it but little thought and study, and he is not in agreement with almost the entire body of intelligent physicians and surgeons.

Dental surgery is, then,—to complete the definition,—primarily a science, to which the art of dentistry has been added as a supplement. Any surgeon has the right,—and his right comes out of the natural justice and fitness of things,—any surgeon has the right to restrict himself to the jaws, or to the buccal cavity, in order that he may devote his

talents and skill more definitely to the relief of the maladies of these regions; but no man has a right, because of its unfitness, to practice major surgery upon the jaws, or upon any other portion of the body, unless he is acquainted with the science of surgery.

Dental surgeons are specialists in surgery, and hold the same rank, and need the same general preparation, as other specialists in surgery.

Permit me, gentlemen, in closing these remarks, to say to you how much I respect and appreciate your calling. Whether you practice as mechanical dentists or as dental surgeons, there is, perhaps, no difference in the dignity of your respective vocations. It is not even apparent that the one demands the exercise of more talent than the other, but each certainly demands a different education and training.

There is no duty which we can perform to relieve the suffering of man, or, indeed, of any sensitive, living creature, which is undignified. It is the purpose for which the act is performed, and the manner in which it is performed, which determine its rank. The duties of a surgeon and of a physician are often, in themselves, sufficiently humble, but they are never humiliating.

My respect for you, gentlemen, is not, therefore, based upon the exact nature of your calling, as to whether it is a handicraft, an art, or a science, but mainly upon the fact that your profession is useful to man, and that you have shown so much zeal and industry in its pursuit. Especially, I may be permitted to say, have the dentists of this city and country made most remarkable progress.

I see before me gentlemen who have acquired world-wide reputations by their inventions and by their contributions to dental science, and in every part of our land there are hard-working, ingenious, and talented men who are working in the same field. If you accomplish as much in the next thirty years as you have in the last, there will not be much left for you to do in the way of regulating the teeth, and you will be compelled to extend the area of your work in order to keep yourselves from being idle. Perhaps then you will invent a bridle for the tongue.

Dr. Atkinson : It is with pleasure that I rise to move a vote of thanks to the author of the very modest and beautiful paper we have just listened to. (Carried.)

Dr. Kingsley said that he had also the pleasure of announcing the name of Prof. Sands, of the medical profession, a gentleman of eminence and representative character in medicine, as having consented at his invitation to address the meeting. He had taken the liberty of

withholding from both Dr. Hamilton and Prof. Sands, in extending them the invitation to speak, the fact that the other would be present, in order that there should be no opportunity for collusion in the matter, and that their views might be obtained entirely independently of each other. Dr. Sands had just arrived, and would be introduced directly. He desired also, in the same connection, to mention another gentleman present, who, he took it for granted, required no formal invitation to address them, namely, Dr. J. Smith Dodge, a gentleman who added to the highest dental proficiency a thorough knowledge of medicine, and who was known and respected by all.

Dr. Sands being introduced, and formally invited to address the meeting, said:—Gentlemen: I am obliged to say that I am entirely unaware of the subject upon which I am expected to address this meeting. I accepted the invitation from Dr. Kingsley the other day, during a moment's conversation, to be present here to night, but I do not know what is expected of me, or what is the precise subject of discussion.

Dr. Kingsley: I called upon the gentleman, and said I understood that he held definite views upon the question of the claims of dentists to be regarded as medical specialists, and to have the rights and privileges which were accorded to other medical specialists; that I thought it would be interesting to you, if he would meet us here to-night and give you those views. And if I did not say more than that, I had it in my mind to say that, more than all, he had had opportunity in his life to make application of those conclusions practically; that we of the dental profession felt that we had some rights which had been denied or deferred by the medical profession; that we knew our side of the story, and we should like to have him give us the other side of the case.

Dr. Sands: I have not reflected upon this subject with a view of speaking here to-night.

I am quite willing to concede the claims which dentists have to be regarded as members of the medical profession, using that term in its widest sense. I am too well aware, both from experience and observation, of the necessity of a sound set of dental organs to deny such claims, if they are made by a gentleman of the dental profession. As to acknowledging anything more specific than this, perhaps I should hesitate; for, while I admit that dentistry is a part of the medical art—using the term in its widest sense—yet it has always seemed to me that the profession of dentistry carries with it so much that is purely techni-

cal; so much that removes it from the domain of medicine as it is practiced by physicians, that it must always be cultivated by them to the exclusion of other branches of medicine, and even surgery. I am even very doubtful whether dentists, as a rule, will find it to their profit, or to their taste, to engage in the surgery of the mouth, apart from such kind of surgery as is now practiced by them, and I have always thought that though here and there a member of the dental profession might, from natural aptitude or acquired taste, perform the operations which the surgeon generally performs on the jaw; in other words, take care of all the diseases of the mouth, that just in so far as he engaged in this kind of practice he would be injuring his practice in his proper dental department; and I have always supposed, and I think I have generally found, that the men engaged most zealously and successfully in the practice of dentistry, had neither time nor inclination to engage in what may be called the surgery of the mouth or jaw. While I consider, however, that the departments of surgery and dentistry must always, for the reason I have stated, remain widely apart, I am of the impression that a very well grounded medical education should afford the basis of the dentist's training, as it does that of the proper medical man.

Several years ago the members of the dental profession made an informal overture to the college with which I am connected, with a view to have established in that institution a department of dental medicine or surgery, and some negotiations were carried on for a month or two looking to that end; but they were not successful. One reason seemed to be the inability of the medical schools to furnish anything like adequate instruction in those branches of knowledge most desired or most essential to the dentist. All that we could teach the dental student would be a knowledge of anatomy, of physiology and of chemistry, as bearing indirectly upon the practice of his own special art; and even in these branches we would not teach him that which he would find most desirable to know; that is to say, in the department of anatomy. Long as I have taught in the college with which I am connected, presenting not less than ninety-eight to one hundred lectures a year, only one of those lectures was devoted to a description of the teeth, and it is evident to any dentist, of course, that only the most superficial description of the dental organs can be given within the limit of an hour. And yet this is the only time that can be devoted to the consideration of this branch of anatomy in an extended course of lectures.

But especially would there be a failing in medical schools in the purely technical part of dentistry. Feeling that we were unable to give

instruction in such a department without a large increase of the corps of teachers, and feeling also that we had no clinical material to offer, we rather shrank from undertaking to do what we felt ourselves unable to do with credit.

A short time since a gentleman, an eminent member of the dental profession, applied to the County Medical Society for admission to membership, and was referred to me by another member of the County Medical Society, an eminent practitioner of medicine. I brought the application before the Executive Committee of the Society, having previously learned from them that the candidate would be eligible, provided he were a graduate in medicine; but when I made formal application on behalf of the candidate, and presented the diploma of examination to the members of the committee, there was an almost unanimous vote in the negative, it being decided not to admit this gentleman to membership in the County Medical Society. And the reason given was this: that although he possessed a diploma from a medical college, this diploma dated back, I think, some twenty years, and there was no evidence to show that the gentleman presenting himself for election as a candidate had ever practiced medicine, or that he practiced, at all events, for a long series of years, and the ground was therefore taken by this Executive Committee, that although they wished to say nothing derogatory or disparaging in regard to this candidate, or any candidate coming from the dental profession, yet they felt that the respective spheres of dentists and physicians must be kept distinct, for their mutual advantage. And while such papers as dentists would be apt to write to edify one another would be of very little use to us, that the contrary would hold, and that also no dental society would tolerate such dissertations and discussions as medical men are apt to inflict upon one another.

Feeling that to be true, the committee refrained from electing this gentleman, who was in every way worthy, because they did not wish to establish a precedent. I have not, gentlemen, any very positive views upon this subject; I hold no views which are not capable, probably, of great modification, for it is a subject upon which I have not bestowed much thought. It may be that I do not lay sufficient stress upon the intimate relations which exist between medicine and dentistry, and, indeed, I have little doubt that if medical societies could listen now and then to a paper read upon some subject of common interest to dentists, physicians and surgeons, by a member of the dental profession, they would be much instructed and entertained; and it is possible,

though I think less probable, that the physicians and surgeons might occasionally read a paper which would be instructive and entertaining to dentists. But I must confess that my mind is biased, or rather convinced, as I have probably hinted to-night, that, notwithstanding the intimate relation which theoretically and at the basis exists between physicians, surgeons and dentists, they will always pursue different paths ; that the busy surgeon will never draw a tooth or plug one, or do more than to recommend his patients (which he ought to know enough dentistry to do) to a competent dentist. On the other hand, as I have said before, the busy dentist will not find it to his interest or profit to depart from one of the specialties within his own specialty, or leave his own department for any other department of dentistry or surgery.

Dr. J. Smith Dodge : I confess, sir, that I have not been able to get up a great deal of interest in this question ; I formed the opinion a good many years ago, and I have never found reason to change it, that people get at the doctor's hands, and everybody else's hands, just about the recognition that they are personally entitled to, and that there is no legerdemain by which a larger amount than any man is entitled to can be permanently secured to him.

I was hatched in one of these nests and brought up in the other, and perhaps may claim as well as most men to know something about each. I have never found the impassable gulf that is sometimes suggested. I think I have had quite as much recognition as I have deserved. I have not found the doctors turning a cold shoulder, or showing in any way an abatement of respect or consideration because I am wholly given to the practice of dentistry. Therefore I do not take a very profound interest in this question ; I think it will settle itself, and that a settlement reached in that way is probably the only one that would be permanent. At the same time, as you have honored me with a request for some remarks, I will endeavor to add something to what the two gentlemen of the other profession have said—something that they have omitted, partly because they cannot see the matter as a dentist does, and partly because they are so generous and tender that they are very anxious not to step on any dental corns. I do not feel quite so delicate myself. I have seen a good many dental corns which I think would be a great deal better for a little trampling. Whether there are any here I am not able, and would not presume to say, for, as you know, I am largely a stranger to this audience.

But when the question is asked whether dentists are entitled to recognition as specialists in medicine, before answering that question, I wish

to ask another, and that is, Which dentists do you mean? because I object to the one word covering the whole fraternity; when a question like this arises, there is a definition which we make in our own minds, which we make in our private conversation, and which will make itself felt in the decision of any such question as this. There are a great many dentists, honest and honorable men, who, in my judgment, have no claim to be recognized as specialists in medicine; no more claims than the optician has who furnishes spectacles for eyes that need them; no more claim than has the manufacturer of wooden legs and arms who fits them to living stumps. These are men who stand about where the vast majority of dentists stood no great number of years ago. And I am by no means speaking in disparagement of them as useless members of the community. I know of no reason why a man may not make very good fillings in teeth, and perform skillfully and usefully the narrower routine of dental practice without any considerable knowledge of medicine, or indeed any more knowledge of it than the old women have when they give the babies paregoric, or their husbands a rum sweat, knowing just enough of the use of drugs for that purpose, and having a slight acquaintance with the superficial phenomena of inflammation. There are hundreds of such dentists doing good to their fellow beings, helping to keep their teeth sound, etc., who yet could not hold their own for a moment in conversation or association with enlightened medical men, who have in justice and in right no claim to be called medical men at all.

They are, shall I say, artisans or artists of a high grade, and their material is the precious metal, gold, and the vastly more precious substance, human dentine and enamel. It is no dishonor, but rather creditable to be so classed. By long experience they have acquired deftness and accuracy in their work, and their calling is eminently beneficial to mankind; but nevertheless it is nothing more than fine mechanical skill, and no degree of skill in it can entitle its possessor to recognition as a medical specialist. I, a dentist, object to all dentists and all men who may in any way deserve that name being in a lump pronounced medical specialists. But if you answer that you do not mean such dentists as I have designated, but some others, then I shall be on the other side of the question, because it is certainly very possible for a medical specialist to be a dentist, by which I mean that a man well educated in medical science, who appreciates its breadth and depth, and is thoroughly inoculated with its spirit, may turn his attention to dentistry, and may find satisfactory applications for a very large

part of his knowledge, congenial to his spirit as an educated man, in the operations which are considered to belong to dentists. But bear in mind it is not dentistry that makes him a medical specialist, it is that which he brings to it, and in proportion as he brings it, just in proportion does he widen the sense of the term dentistry. I am glad to say that every year, and especially every decade, adds to the profession of dentistry considerable numbers of such men as these.

It should be so, and so I have faith to believe it will be, until that wider culture becomes the type and standard of the dentist. Of course there always will be men to take out teeth and fill them, but yet it is possible to effect so much of a revolution in the typical idea of the dentist as to make the representative dentist a man who is also a medical man. I would not think of educating a young man to practice dentistry, if I took upon myself the responsibility of his education, without first educating him in medicine pure and simple, and not only in so much of it as is necessary to get his diploma and liberty to practice, but some of that instruction which comes from bedside observation and practice.

For myself I am profoundly thankful to the parental wisdom which gave me what I have, always with a view to the practice of dentistry. This is the foundation which should be laid, but I do not believe it is competent for a dental college—in the length of time, at any rate, that professional opinion concedes to the course there at present—to give this foundation as a dentist should have it. Any man who is first so thoroughly grounded in medicine that he is a medical man, not merely in name, and upon sheep-skin, but in the tone of his thought; in the eye through which he views all the phenomena of life—any man who is so grounded, makes his dentistry a specialty of medicine.

But I desire to say nothing in disparagement of the dental operator, in the restricted sense of the term dentist.

There is no operation in major surgery which calls for greater facility of touch, keenness of sight, and quick adaptability to the ever new emergencies of each moment, than some of the operations we are called upon to perform at our operating chairs day by day. And these great and stimulating operations in which the surgeon is engaged derive their importance and thrilling import more from the fact that the immeasurable state of a human life hangs upon the right direction of the scalpel than upon any delicacy or fineness of use in tools or fingers. That may be equaled in many other callings, but the skillful dentist may justly claim, in his more critical operations in filling teeth, to have

reached the utmost extent of skill which human eyes and fingers, and the closest attention, are capable of in mechanism. I only wish to say that there is no reason why gentlemen with so large claims to consideration as artists and benefactors of their fellow men, should seek the additional glory which they fondly fancy would come to them from being associated with medical men.

Dr. Atkinson : I have spoken so often upon this subject, and am in such poor speaking condition to-night, that I had hoped to escape being required to simply repeat what I have so often said before, namely : that it is the man and his development which constitutes his fitness for any of the callings known to human life.

I endorse almost everything said by the speakers upon the subject to-night.

But, gentlemen, the time has come when we are no longer under the necessity of cringing for a recognition that we did not deserve. And any man in any calling who feels at all the responsibility of his calling, can well afford to let the recognitions take care of themselves. The great criticism I would perpetrate, if I may use the term, upon any of the professions, is the lack of being in dead earnest religiously to do what they think is right at that moment, throwing all the soul's armor off, throwing all the false glare off, disregarding false lights, and doing their best by the oldest and most approved methods. Now, if dentists have anything to be proud of it is that they have no mistakes which can be laid hold of ; but I do not say that a man, however nice a mechanic he may be, if not acquainted with the histology and mode of nutrition in the building and removing of the human teeth, can at all compare with a man of less manual dexterity, who couples with it a clear apprehension of the origin and culmination of the human teeth to their highest usefulness, and then in their decadence. So far as mere mechanical execution is concerned, the history of the war and the records of all past operations made in the presence of the surgeon by the dentist, and by them jointly, we, as dentists, have no reason to be ashamed.

I had a pupil, between whom and this world the curtain of death is now drawn, who was a marked illustration of this. During the late war, in making his first surgical operation, in an amputation at the hip joint, the surgeons and medical men around admired the operation very much, and would not believe he had never made an operation upon a living subject before.

He was not a good student the first two years ; he only began to be

awake to the advantage of what can be obtained from books after two years' hammering at him to make him appreciate and realize that sense of knowledge. It was simply his dexterity in manipulation ; and even his ignorance was an advantage to him. He did not appreciate frequently the danger he was in, and he had the over-shadowing presence of a man of thorough skill to superintend and direct his movements. And this leads me to remark how we are stimulated and supported by the presence and encouragement of one we love and put confidence in.

In conclusion let me express the hope that we may become more thoroughly earnest, and that we may *work* out our recognition at the hands of the medical profession and the world.

Dr. Bogue: I want to express just here one word of regret that Dr. Sands, at least, was not better informed in reference to the subject, as it seems to have come up before us this evening.

Prof. Hamilton seems to have thought upon the subject somewhat more, and somewhat more connectedly, as he has put his thoughts upon paper ; but I think it is due to both these gentlemen to say, before they leave us, that we, as a calling, are almost as much divided upon this subject, as they might have inferred from Dr. Dodge's remarks, as the medical and dental professions can be; and that however hard they may hit, if they felt so inclined, they could hardly tread upon many dental corns.

It was moved and seconded that the subject of the paper read be laid over for discussion at the next regular meeting.

Dr. Bogue offered as an amendment that the paper, when taken up, be considered section by section, and also that the author be requested to complete it. (Carried.)

Dr. Dwinelle moved that the thanks of the audience be extended to Messrs. Hamilton, Sands and Dodge for their interesting and instructive remarks. (Carried.)

Adjourned.

APPROXIMAL FILLINGS.

Read before the Seventh District Dental Society by F. E. HOWARD, M.D.S., Geneseo, N. Y.

Approximal fillings are considered by all to be the most difficult class of fillings we have to contend with, therefore we should be prepared to baffle with the most difficult cases of them under all circumstances, and with success. If we can do this we will have no trouble with other operations in filling.

Let us take, by classification, some of the approximal cavities of different teeth and try to fill them successfully. I shall not refer in this paper to those cases where extensive decay has taken place, where the labial surface is gone, and where contour fillings are necessary.

First let us commence with the superior left central incisor—and all that may be said in regard to this tooth will apply to all of the upper six front teeth, viz.: the incisors and canines.

If a patient is presented and these teeth are to be filled, never mutilate these valuable organs by trying to fill them from the front surface, to avoid back-ache and to exhibit your handiwork, and thereby make of your patient an advertising medium. Far better put all of this work out of sight by filling from the under side, from the palatine surface. It will be far more lasting to your patient and of much more credit to yourself in the end—it is art to conceal art.

The first step to be taken in this direction is to introduce a small wedge, not particularly for the purpose of getting room, but to press back the gum slightly, and afterwards to protect it from the files and cutting instruments in general, and also to assist in holding the rubber dam in place; then with a chisel, or with a diamond reamer, cut out that portion well. Don't be timid about this work, for herein is the first stepping-stone to success in this class of fillings. Then, with instruments that can be used to the best advantage, remove with three or four cuts about all of the decay; next proceed to shape the cavity. Look well to the inner portion of the cervical wall, the under cuts, or retaining grooves. These are gotten at the cervical portion of the tooth, and extend down as far as practicable toward the cutting edge, at the labial and palatine part, leaving that portion nearest the cutting edge merely concave with the orifice, as all retaining pits and under cuts at this part of the cavity, as a general rule, only tend to weaken the tooth.

Now that the cavity is shaped, and all things in readiness, we will proceed to fill the tooth. With a couple of pellets of non-cohesive soft gold, rolled up between the fingers into a conical form, and slightly annealed at the large end, we will place in the retaining pits at the cervical part of the cavity, and fully secure them there with soft gold annealed or cohesive pellets attached to these anchors, pack the gold well at the cervical wall, the labial and palatine portion, ending up nearest the cutting edge of the cavity. This should all be filled flush, and firmly consolidated toward the centre, and afterwards burnished over.

Now that this part of the work has been accomplished, we will com-

plete the operation by finishing off with files, emery cloth, tape, pumice or chamois strips, and lastly, I would recommend pulverized chalk used on the same. However, the material used for this purpose is a matter of taste with the operator. Then, if you wish to give the filling more of a metallic lustre, finish with a little soap and a burnisher.

The operation is now completed.

The great advantage in doing the work in this way is the fillings are all out of sight, and there being a broad space upon the under side, the suction of the tongue will keep the fillings almost entirely clean, which is very desirable.

There need only be about a thirtieth part of an inch space between the teeth (or none at all if you so desire). This is hardly noticeable and is often the salvation of fillings. The condition of things can be seen at all times.

If the teeth wear down in after years by mechanical abrasion there are no weak walls to give way by this change in the condition of things, no disturbing the anchorage of the fillings, as these are all in the upper part of the cavity, and will remain until entirely obliterated by the wearing away of the teeth.

Bicuspid come next in order, and all that I may say respecting these teeth will apply to the molars also.

First the left superior bicuspid. We will introduce a small wedge for the purpose, as before stated. And right here let me speak at more length upon this subject, the wedge.

Those cases where decay extends far up under the gum we often see filled in a bungling and unreliable manner, calculated shortly to give the patient trouble and mortify the operator. There are few cases that ever present themselves that are located in the anterior part of the mouth or even extend back as far as the space between the first and second molars, that cannot be overcome with the wedge. It is sometimes necessary to lance the gum from the buccal to the palatine portion, and up to the alveolar process. Then make the calculation how far the decay extends up, and introduce the wedge with hand pressure. If you have not succeeded in getting above the decay, put in another wedge above that, and pull the first one out. Perhaps it may be necessary to repeat this again, but if you will persevere you will be successful in gaining the ground sought for. Then, with one hole cut in the rubber, embracing two teeth and the wedge, the case will present such an appearance as is likely to result in a successful operation. The wedge should remain until the filling is entirely completed, then upon removal the gum will heal in a few days.

These cases are more successfully overcome in this way than any other that I know of. The matrix is good in many instances, but not so reliable as this method in the majority of cases, and is just as painful to the patient; and besides, when we find cases of this character we almost always find two teeth decayed, and by this method we have more room, which is very desirable. Let me again return to the subject of filling bicuspid teeth.

Next break in the grinding portion to unite it with the approximal, if the case will admit; then with chisels cut the walls about parallel with the buccal and palatine portion of the tooth, up to the cervical part; work the cervical portion transverse with these, remove all of the weak parts of the tooth in this operation, and if the teeth are of a soft character and quite susceptible to decay, leave a V-shaped space between the teeth. This can be done judiciously with the engine and disk. If the fissure is imperfect, extending over the grinding surface and likely to result in subsequent decay, it should be cut out and united with the main cavity.

Now, with a chisel the orifice should be shaped and smoothed as before recommended, and from the angle at the buccal and palatine portion of the upper part of the cavity cut a groove down to the grinding portion of the tooth. We now have a dove-tailed space, so to speak, to fill.

The following is, in my judgment, the best method of filling these cavities:

Make two block cylinders, in ordinary cases of non-cohesive foil, that will fill the space, before they are consolidated, from the buccal to the palatine portion, and extend from the cervical wall to about two-thirds of the way to the grinding portion of the tooth, and also be flush with the orifice of the cavity. One end of these cylinders, or the surface of the blocks, should be very slightly annealed, leaving the body of the block soft. By this method pellets of cohesive gold can afterwards be more securely attached.

Then, after putting one block in position, press it to one side and introduce another; press both of these home to the cervical wall, and at the same time use lateral force upon the filling with a thin burnisher. A thin file passed between the teeth will act as a matrix in introducing the gold, and can be removed from time to time, so that extra lateral force can be exerted upon the filling and the condition of things seen at all times.

Now the more force you exert upon the gold, either in the way of

hand pressure or mallet, the more securely you drive it against all of the walls of the cavity, for it is dovetailed, and the gold must take the shape of the cavity. This will give you a foundation to build upon that will never stir. It is like a house founded upon a rock.

If the cavity is deep from the grinding surface to the cervical wall put in another layer of cylinder ; if not, commence immediately and attach your cohesive pellets, and finish up in the usual manner.

If the circumstances of the case will not admit of the use of gold prepared in this form, on account, perhaps, of the shape of the cavity—which would be in rare cases, where extensive decay had occurred, and the anatomical formation of the tooth was of such a character that the cavity would necessarily be about round on the approximal surface and could not be changed from this—we have only to put two retaining pits at the cervical wall, and obtain our first anchorage in the manner spoken of in filling incisor teeth.

The great advantages of using block cylinders are, first, it saves time—it gives you the same anchorage as though you had used pellets from the commencement.

Their adaptation to the walls of the cavity are more desirable than that of cohesive pellets, for each lamina of gold is differently associated under these circumstances from what it would be if cohesive pellets were used.

If there is any elasticity in gold, and there must be some, it takes the advantage of this, and soft gold wedged in in this manner bears the same relationship to the cavity, in a measure, that a piece of rubber does crowded into a smaller space than itself.

Now that we have the cavity filled we will next proceed to finish it up, and this work can be done almost entirely with the engine.

The corundum disks will do the work between the teeth, and small wheels will work down the grinding portion. The rubber and box-wood disk and wooden points will carry a polishing powder that will finish your work in a beautiful manner.

The operation of filling approximal cavities in molar teeth is identically that of bicuspid, and the method of filling lower bicuspid and molars exactly that of the uppers.

We will proceed to finish up with an inferior central incisor, and this will be applicable to all of the six lower front teeth. As these teeth stand at a different angle in the mouth from the upper ones, and as decay seldom attacks the lingual portion, but rather approaches the labial, it would seldom be advisable to fill the cavity from any other

than the front surface, although with canines it may be done in some cases to advantage from the lingual surface.

The separation that is made with files upon these teeth should be broadest from the front surface, exactly opposite to that of the uppers, to ease our facilities in operating, and also to separate the fillings slightly to guard against subsequent decay, which is most likely to attack them from this quarter. Fortunately, however, these teeth are not so susceptible to decay as the uppers. This we may consider a blessing for all concerned, for if they were we would not be able to combat decay with the same success, on account of the anatomical formation, position in the jaw, and other circumstances connected with filling those teeth that are often presented.

Now that the separation is made we will proceed to shape the cavity that generally presents itself. We will usually be able to get a perpendicular surface against the lingual wall, and at the angle of the two extremes of this wall we will get a retaining pit. From angle to angle this orifice of the labial portion of the cavity assumes a semicircle.

The lingual wall should be little more than parallel. From the retaining pits at the angles there should extend a groove toward the peripheral centre of the semicircle.

Now that the orifice is properly smoothed the cavity is ready for the gold. Many of these cavities can be filled to good advantage with cylinders, and when they are admissible we will slightly anneal the surface, lay two or three blocks against the lingual wall, and press them securely through and into the grooves or pits, and attach to this anchorage cohesive pellets.

If we desire to fill with pellets from the beginning, we will prepare and secure them in the anchor groove the same as we advised in filling upper incisors.

Now, if this have all been done properly and faithfully, from the beginning to the end, you need not worry about the result. If your patient has been properly instructed how to clean the teeth on all of the surfaces, and will do the work sufficiently to prevent decay recurring, the fillings will last and preserve the teeth many years. They will do credit to any practitioner, and be a lasting blessing to the possessor.

THE French Academy of Sciences has awarded a prize of \$4,000 to M. Paul Bert for his original researches on the effect of barometric pressure on the phenomena of animal life.

TO THE DENTAL PROFESSION.

The American Academy of Dental Science, Boston, Mass., design presenting to the profession and the public, at the approaching Centennial, a view of American dentistry, past and present.

One of the characteristics of this presentation will be a history of the profession in this country, particularly for the past one hundred years. This work being designed to become a standard of reference, will be comprehensive and complete in detail.

To the end that this desirable result may be attained, the committee in charge respectfully request the aid of all dentists (and others) in furnishing information of every kind necessary to the work. Below will be found a list designed to afford a general idea of the kinds of information needed, on these and kindred subjects, and, indeed, on *any* subject connected with the profession—nothing will be regarded as too small or insignificant to be of value.

If desired, any material received will be carefully preserved and returned to the sender after use.

To facilitate this, as well as insure credit being properly given, everything should be marked with the name and address of the sender.

The committee are persuaded that the importance of such a work to the profession can hardly be overrated. Several small works, able as far as they extend, have been put forth.

But as yet nothing on the scale laid out for this work has appeared. The committee feel assured, therefore, that they can rely on the hearty co-operation of the profession in furnishing the information above mentioned.

LIST OF SUBJECTS.

Biography, literature, societies, colleges, individuals, mechanical and operative dentistry, discoveries in any branch of the profession, *materia medica*, prominent events (with dates), prominent questions, inventions, patents, anecdotes, sayings, historical facts, obituaries, addresses, papers, published and unpublished works, etc., etc.

Address communications and material to George T. Moffatt, M.D., No. 1 Hotel Boylston, Boston, Mass. ; *or to* James E. Dexter, care W. A. Bronson, M.D., No. 8 East 34th Street, New York City.

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A NEW APPLICATION OF THE SPECTROSCOPE.

There is apparently no limit to the achievements of that marvelous instrument, the spectroscope. It can compel suns and stars to yield up the secrets of their physical and chemical constitution, and it can detect a minute adulteration in a phial of medicine. It can analyze rays of light too faint to be discerned except with the aid of the most powerful telescopes, and coming from distances so vast that it has taken years for them to reach our earth ; and it can compel a grain of salt dissolved in a hogshead of water to declare its presence by luminous characters that cannot be misinterpreted. One of its latest applications has probably been the means of settling a disputed question which it would have been difficult, if not absolutely impossible, to determine conclusively in any other way. Do insectivorous plants really digest the insects they entrap ? Darwin has endeavored to prove that they do ; but notwithstanding the array of facts he has presented in his recent book on the subject, he has failed to convince certain botanists, who still maintain that the dead insects undergo decomposition, but are not actually assimilated by the leaves. Professor Morren has recently advocated this view with much learning and ability, after a careful investigation of all the phenomena.

It occurred to Mr. J. W. Clark, of England, that the spectroscope might be employed in the examination of this matter. He therefore

obtained a number of plants of *Drosera rotundifolia* and *Pinguicula lusitanica*, and fed the leaves with the bodies of freshly-killed flies soaked in citrate of lithium. He took all necessary precautions to prevent the solution from being carried mechanically to other parts of the plant. After an interval of about forty-eight hours various portions of the plant were reduced to ashes and tested for lithium with the spectroscope. The colored lines characteristic of that metal at once flashed forth, proving that the products of digestion, after absorption by the leaves, do enter the leaf-stalk, and are thence distributed to other parts of the plant.

If the experiments made by Mr. Clark, and reported by him in full in the *London Journal of Botany* for September, were conducted as carefully as he represents, the results obtained admit of no different interpretation. Other investigators will of course repeat his experiments, and his conclusions will soon be confirmed or contradicted. If the spectroscope has not already put an end to the dispute, we may be sure that it will soon do so.

AN EASY METHOD OF ANALYZING WATER.

The minute and exhaustive analysis of water is necessarily only possible with skilled experimentalists and a knowledge of chemistry which not even all professed chemists really possess. But, notwithstanding, there are some rough-and-ready tests which every pharmacist ought to be acquainted with, and which would stand him in good stead in many a time of difficulty if he had convenient appliances at hand. Such a set of apparatus has been fitted up under the direction of the London and General Water Purifying Company. It is contained in a very convenient case, small enough for the pocket, and, in fact, constitutes a little laboratory in itself, enabling any one, if ever so little acquainted with chemistry, to find out whether a water contains any of the impurities generally met with in it. Although the little apparatus has no pretension to supply the place of, or dispense with the necessity for, an accurate qualitative and quantitative chemical analysis, yet it will be found of use by medical and scientific men who may have occasion to ascertain, in a ready way, whether any of the more usual impurities are present or not.

The case contains two test tubes, a dropping glass, and seven bottles containing the standard test fluids.

These fluids may be the following :

- No. 1. Test for ammonia (Nessler's Solution).
- No. 2. Test for decomposed organic matter (potassic manganate).
- No. 3. Negative test for lead (plumbic acetate).
- No. 4. Positive test for lead (potassic bichromate).
- No. 5. Test for carbonate of lime (ammonic oxalate).
- No. 6. Test for sulphate of lime and sulphuric acid (baric nitrate).
- No. 7. Test for iron (potassic ferrocyanide).

No. 1 will show whether ammonia is present or not, and although this substance may be derived from other sources than the putrefaction of organic matter, there is always a strong presumption that this matter is present when ammonia is found. Add a few drops to the water, and, if ammonia be present, a cloudy or milky appearance will be observed.

No. 2 communicates a bright violet-rose color to the water when first added. If, however, decomposed organic matter is present in a degree hurtful to health, this color is changed to a dull yellow; or, if a still larger quantity exists in the water, the color will in time entirely disappear. Where the color is rendered paler, but still retains a decided reddish tinge, then we may infer that although putrefying organic matter is present, it is so in such minute quantities as are not likely to be immediately hurtful. One drop to the smaller, or two to the larger test glass, is the quantity of this fluid to be added to the water. [The smaller the quantity of this test applied the sooner will the result be shown. It is also essential to test the water previously for iron (with the No. 7 test), as, if present, it will mislead, as the indications will be the same as if organic matter were present.] It should be allowed to stand for two hours; if, however, the change in color takes place before the expiration of this time, it is a stronger indication of the impurity of the water—the rule being that the quicker and more perfect the discoloring of the water tested, the greater is the quantity of decomposing organic matter present; if, also, upon the addition of a few more drops, a change in color is manifested, it is a sign that a very large and dangerous quantity of putrefying organic matter is present.

To test for lead there are supplied two tests—No. 3 and No. 4. The object of No. 3 test is to ascertain whether a water is at all capable of holding lead in solution. If by adding a few drops a milky or cloudy appearance presents itself, it shows that the water is not capable of holding any lead in solution; but, on the contrary, in No. 4, if upon the addition of five drops to the larger, or three drops to the smaller tube, a dull or clouded appearance ensues, then it is certain that lead is

present. The quantity in solution will be indicated by the degree of opaqueness produced; but, however small this may be, it may be taken for certain that such water is dangerous for use. To test for carbonic acid and carbonate of lime or chalk, No. 5 is the best test fluid, of which add from five to ten drops. If carbonate of lime be present, the water will show, after a little while, a clouded or milky appearance, and in a few hours a white precipitate will be found at the bottom of the tubes. If this appearance takes place before, and not after a short boiling of the water, it is a proof of the presence of free carbonic acid, but if it takes place also after the boiling, then it must be carbonate of lime. To test for sulphate of lime or sulphuric acid the fluid No. 6 is used. If sulphate of lime be present it is indicated in the same way as in the last case—that is, by a milky appearance, and by the formation of a white precipitate after adding a few drops. Sulphuric acid is found by the same means; and it makes the same appearance with this difference, that when the cloud sinks to the bottom it indicates sulphate of lime, whilst if it remains at the top, or is uniformly diffused, it proves the presence of sulphuric acid.

The test for iron is No. 7. If, upon adding a few drops to the water, a blue color is produced directly, or after some time, it shows that iron is held in solution. From the intensity of the color the quantity present may be inferred.

NOTES.

Philadelphia Dental College.

The auditorium of the Academy of Music was thronged from pit to dome on the occasion of the thirteenth annual commencement of the Philadelphia Dental College. In fact, there have been few college commencements within the past few years so well attended or so popular as those of this college usually are. On the stage were seated ex-Governor Pollock, Dr. R. Shelton Mackenzie, Dr. J. H. McQuillen, dean, and a large number of prominent citizens. In front of the stage were the floral gifts usually presented to the graduates. Some beautiful selections were given during the course of the evening

by the Carl Sentz Orchestra in their notably masterly manner. The proceedings were opened with prayer by the Rev. D. C. Babcock. After the rendition of a religious song by the orchestra, ex-Governor Pollock, on behalf of the Board of Trustees, conferred the degrees upon the graduates. While doing so he took occasion to compliment the Faculty of the College on the admirable and thorough manner in which they had instructed those under their charge. This, he said, was instanced by the remarks of Professor Reese, of the University of Pennsylvania, who had officiated in the place of a member of the board of Examiners who was

too ill to attend to that duty. Professor Reese's opinion on the excellent instruction that the students had received pleased him very much, and he had no doubt that it was as highly gratifying to the other members of the Board of Trustees as it was to himself. The following is the list of graduates :

Conrad Allgoewer, Germany, "Tongue and Glossitis;" James Walter Allen, Pennsylvania, "Dental Caries;" J. Finley Baker, Illinois, "Mechanical Dentistry;" Charles S. Butler, New York, "Caries;" Charles I. Bailey, New York, "Digestion;" Matthew H. Cryer, England, "Teratology and Deformity;" George G. Cardwell, Pennsylvania, "Gold as a Filling;" William A. Dartt, Wisconsin, "Gold for Fillings;" Henry I. Dorr, California, "Salivary Calculus;" Elof Forberg, Sweden, "Secretion of Saliva;" Ferdinand Foerster, Pennsylvania, "Orthodontia;" G. Osborne Hannah, New Brunswick, "A Tooth Pulp;" Ned M. Harry, Pennsylvania, "Preparation of Teeth Filling;" L. P. Holbrook, Ohio, "What a Dentist Owes his Patients;" George Hyde, Nova Scotia, "Caries of the Teeth;" J. H. Heivly, Pennsylvania, "Artificial Dentures with Continuous Gums;" James H. Keenan, Pennsylvania, "Respiration;" Henry C. Longnecker, Pennsylvania, "The Imponderable Agents;" Henry W. Morgan, M.D., Tennessee, "Anæsthesia;" Charles F. Malbon, Maine, "Alimentary Canal;" Frank McBeath, Wisconsin, "Dentes Sapientiæ;" Edward P. McLean, Canada, "Pain in Surgery;" Eben G. Murrah, Georgia, "Digestion;" M. J. Noble, Ohio, "Gold vs. Rubber;" Samuel W. Neall, Pennsylvania, "Systematic and Pulmonic Circulation of the Blood;" J. Burckmyer Patrick, Jr., South Carolina, "Orthodontia;" Charles S. Patrick, South Carolina, "The Effects of Cheap Materials on Mechanical Dentistry;" Byron D. Palmer, Ohio, "Alveolar

Abscess;" Carl Remenovski, Austria, "Inflammation;" Eugene G. Regennas, Pennsylvania, "Mastication;" Henry A. Robbins, M.D., District of Columbia, "Constitutional or Seconary Syphilitic Ulcerations of the Mucous Membranes of the Mouth and Surrounding Tissues;" Henry Rea, Canada, "The Blood;" Manuel Franco, Seiglie, Cuba, "Consequences of Inflammation;" Maurice W. Steiner, Illinois, "Anæsthetics;" R. Atmar Smith, South Carolina, "Continuous Gum;" Miguel Ferreira da Silva, Brazil, "Dezenvolvimento dos Dentes de la Denticao e accidentes de Erupcao;" C. R. Taylor, Illinois, "Neuralgia of the Trifacial Nerves;" David Scott Thomas, Ohio, "How to Practice Dentistry;" J. Otto Urban, Prussia, "Odontalgia without Caries;" W. Armston Vice, M. B. C. M., England, "Irregularities;" Gustav von Walthur, Russia, "Dr. Stiersen's Obturators;" Jay Thomas Wardrobe, Wisconsin, "Circulation;" Jackson Williamson, Pennsylvania, "The Organs of Circulation;" I. Franklin Wardwell, Connecticut, "Permanent Separation."

An overture was played by the orchestra, after which Professor D. D. Smith, D.D.S., was introduced. He addressed the graduates on the duties that devolved upon them as members of the dental profession, and called on them to rest not from their labors, but to push forward by every means within their power the literature and status of their chosen calling.

New York, March 1st, 1876.

JOHNSTON'S DENTAL MISCELLANY:

The tenth annual commencement of the New York College of Dentistry was held at Chickering Hall on Monday evening, Feb. 21st, 1876.

The degree of Doctor of Dental Surgery was conferred upon twenty-seven

candidates, by Dr. Wm. H. Allen, President of the College.

Prof. Faneuil D. Weisse, M.D., delivered the address to the graduates.

George M. Eddy, D.D.S., of the graduating class was the valedictorian.

The Faculty Prize of a set of instruments valued at \$100, was awarded to George H. Dunster, D.D.S., of St. Petersburg, Russia. The names of the graduates are as follows :

George H. Dunster, of Russia ; Charles Pullin, of New Jersey ; George J. Hartung, of New York City ; George M. Eddy, of New York State ; Charles W. McCall, of New Jersey ; Stuart H. McNaughton, of New Jersey ; L. Chapman Smith, of Brooklyn ; J. Osbourn Edwards, of Java ; Julio Lyon, of Santo Domingo ; Wm. C. Bergman, of Germany ; George J. Pack, of New York City ; Julius W. Ditmann, of Germany ; Wm. D. Tenison, of New York City ; David Engel, of New Jersey ; Wm. H. Barnum, of New York City ; Emanuel Voerner, of Germany ; Montieth E. Close, of New York City ; Charles F. Rabell, of New York City ; Francis E. Pratt, of Michigan ; Luis Restrepo, of United States of Columbia ; Eben M. Flagg, of South Carolina ; Frederick D. Tomlinson, of New York City ; Henry DeVriés, of Connecticut ; Fred H. Lee, of New York City ; Albert J. Wright, of Owego, N. Y. ; Rufus G. Stansbrough, of Newburgh, N. Y. ; Alonzo B. Miller, of Brooklyn.

Their theses consisted of written answers to a certain number (5) of general questions put by each professor.

The number of matriculates for the year is seventy-nine.

The Spring and Summer terms of practical instruction commences the first of April.

FRANK ABBOTT, M.D., *Dean.*

The dentists of Columbus, Ohio, will not give their lady patients laughing gas

or ether after this date, except in the presence of witnesses. They seem just to have discovered the danger of their former practice. A young lady in that city, who recently had a tooth extracted while she was under the influence of laughing gas, charges that the dentist took advantage of the circumstances to insult her. The dentist, although he admitted having taken the tooth out, declared that her statement was too thin, and laughed her to scorn. Then her friends prepared to immolate the tooth carpenter, but he was ready for them, and when they came charging into his office he filled the biggest man in the crowd with shot, and was then left severely alone. But the tooth-scrapers held a convention immediately, and resolved they would never do it again, they didn't care how innocent they were.

The use of Pestles and Mortars for Mixing Small Quantities of Amalgams, Etc.

The use of a pestle in a very small mortar for mixing amalgams and oxychlorides is undoubtedly a mistake. If a pestle is used it necessitates the use of a much larger proportion of fluid than is really necessary to make a stiff paste ; but if instead of a pestle a small spatula is used, working the materials to be mixed against the *side* of the mortar instead of the bottom, the action and the result are precisely the same as when the mixing is performed in the hand.

As the results obtained with almost every amalgam are so very much better when a very small proportion of mercury is used, this hint will be, no doubt, a valuable one to those who dislike mixing in the hand. Until I discovered this mode of working I was under the impression that very dry amalgams could not be properly mixed in a mortar without very great difficulty, but the use of a spatula instead of a pestle renders this, if anything, an easier matter in the mortar than in the hand. Small flat slabs are com-

monly used for mixing oxychlorides, but they are much easier to work and keep in a compact mass if a mortar and spatula are used, as the liquid cannot run away, and the powder cannot fly about, as it is liable to do on a flat plate.—THOS. FLETCHER.

Replantation.

January 2nd, 1876, Mr. Charles Ellis, of Brooklyn, aged 26, called at my office, suffering with the toothache in the first right inferior molar.

As he desired to save the tooth, I commenced treatment preparatory to filling. He left my office, but returned in two hours, saying the pain was unendurable, and would like it extracted. I extracted the tooth and replanted it. It required considerable pressure to force it back; when about two-thirds down it seemed to stick, but with more pressure it shot back into the socket as perfect as before I extracted it.

January 10th the patient called again, highly pleased with his tooth, having no trouble in masticating with it. The cavity, which is in the buccal part of the tooth, and quite large, I intend to fill in about three weeks hence.

O. J. ALLEN.

The Arsenic Eaters of Styria.

When an account of the Styrian arsenic eaters was first published in England, several years ago, it was thought by many to be a scientific hoax, and even to this day the facts are sometimes questioned. Facts they nevertheless are, and we find in recent foreign journals some fresh testimony on the subject. At a scientific meeting, held within a few months, at Gratz, in Styria, Doctor Krapp presented two arsenic eaters of the district, and gave

the following interesting details concerning the practice:

It is difficult to give precise statistics as to the increase of the number of arsenic eaters in Styria, but I am convinced that there is a great number of them. They are mostly stable-boys, wood-choppers, and foresters; there are also some women. Many of these individuals commenced the practice at the age of seventeen or eighteen years, and have continued it to a very advanced one. They generally keep the fact a secret; consequently, it is difficult to realize the actual development of the practice. They give as a reason for this habit that it protects them from other maladies, and also gives them an appearance of real health; that it is a remedy for difficult respiration, and also aids the digestion. A hunter who ate arsenic before my eyes assured me that he acquired courage little by little so as to continue the practice. There can be no doubt that the arsenic eaters enjoy seeming good health, and are very robust. I think it can only be very strong persons who could take up and continue this habit; some of them arrive at a great age. I saw at Zeirung a coal-miner aged seventy years, who was vigorous and alert, and who, I was told, had followed arsenic eating more than forty years. Another case was that of a chamois-hunter, aged eighty-one years, who for many years had made use of it. It results, from further observations that I have made, that either the white or yellow arsenic is made use of, and in a dry state. The dose is naturally very small at first, increasing gradually; the largest dose that I saw taken was 14 grammes. There are intervals between the doses of fifteen days, a week, and sometimes only two or three days.—*Boston Journal of Chemistry*.

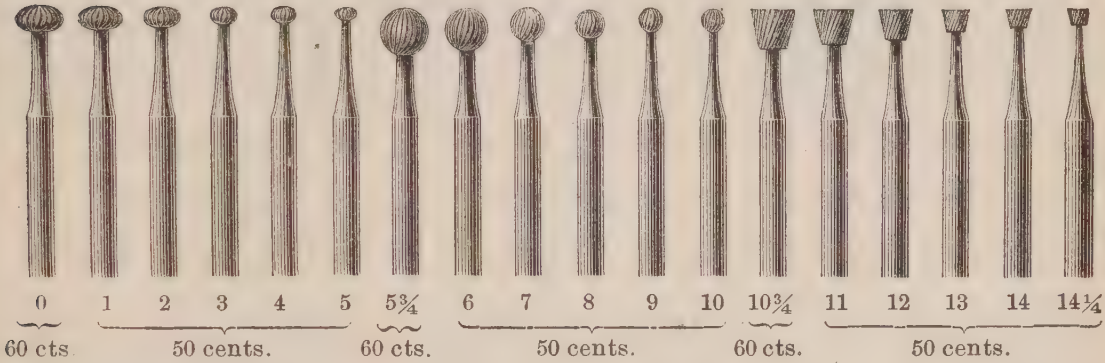
CATALOGUE OF Instruments for Dental Engines.

Each Bur will fit either the Morrison, Suspension or White Engine.

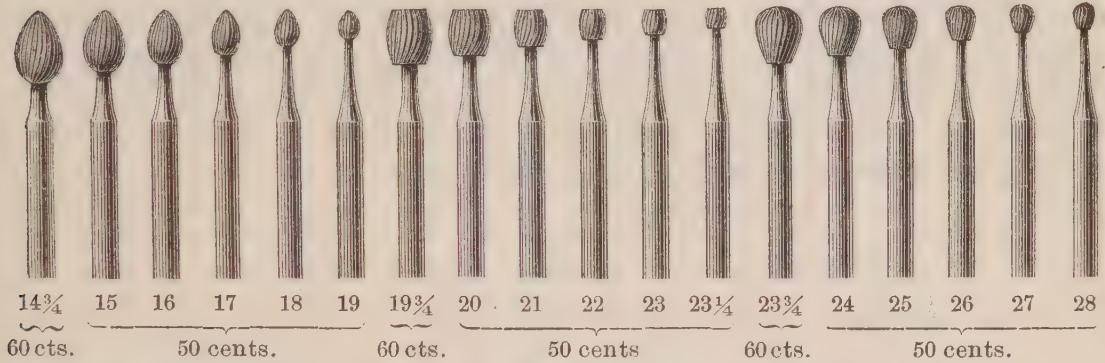
Patented September 10, 1872, February 24, 1874.

PLUG FINISHING BURS:

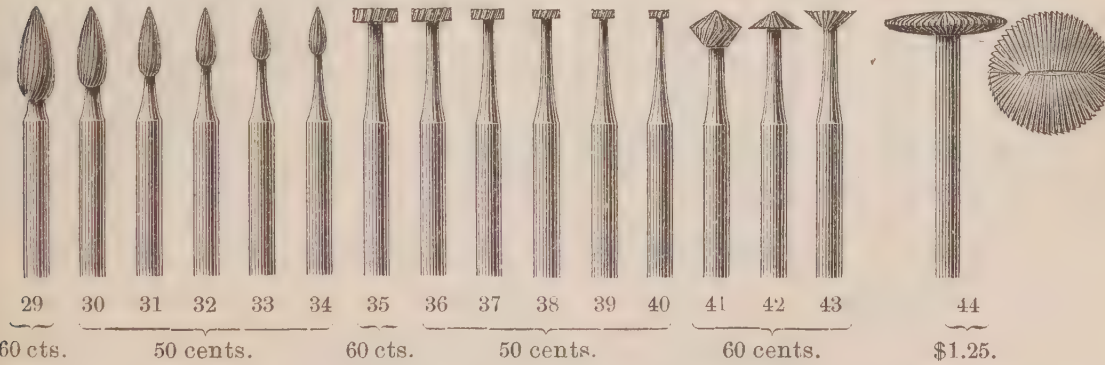
Oval. Round. Inverted Cone.



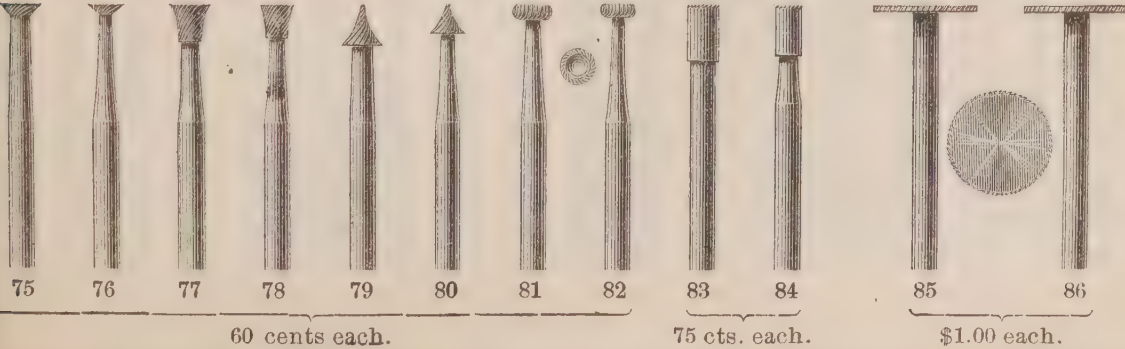
Bud Shape. Barrel Shape. Pear Shape.



Flame Shape. Wheel Shape.



New Forms Finishing Burs. Trephines. Plate Saws.

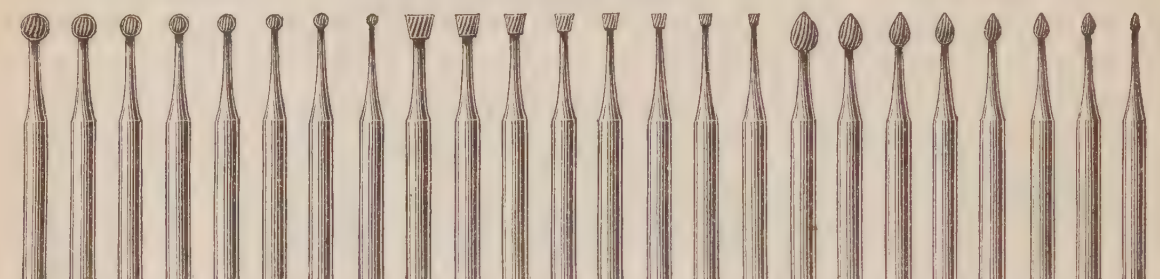


CAVITY INSTRUMENTS.

Round.

Inverted Cone.

Bud Shaped.



100 101 102 103 104 105 106 106½ 107 108 109 110 111 112 113 113½ 114 115 115½ 116 117 118 118½ 118¾

25 cents each.

25 cents each.

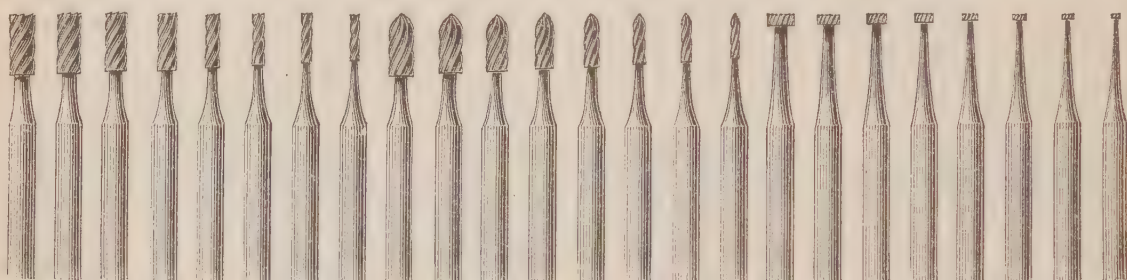
25 cents each.

For extra large sizes of these forms see below, Nos. 154 to 177.

Square Fissure.

Pointed Fissure.

Wheel.



119 120 120½ 121 121½ 122 123 124 125 126 126½ 127 128 129 130 130½ 131 132 133 134 135 136 137 137½

25 cents each.

25 cents each.

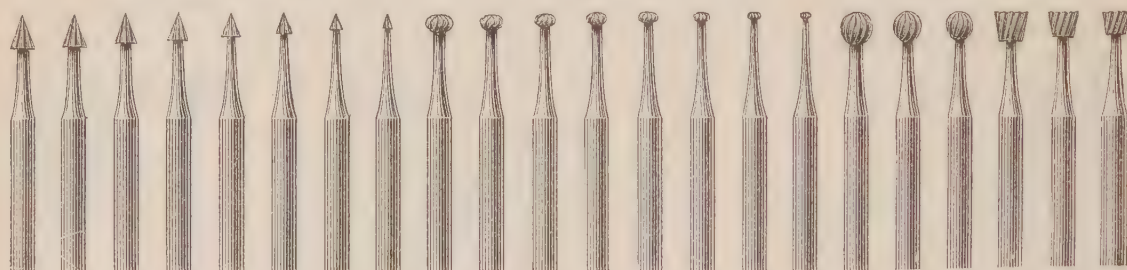
25 cents each.

For extra large sizes of these forms see below, Nos. 154 to 177.

Cone Shaped.

Oval.

Extra Sizes.



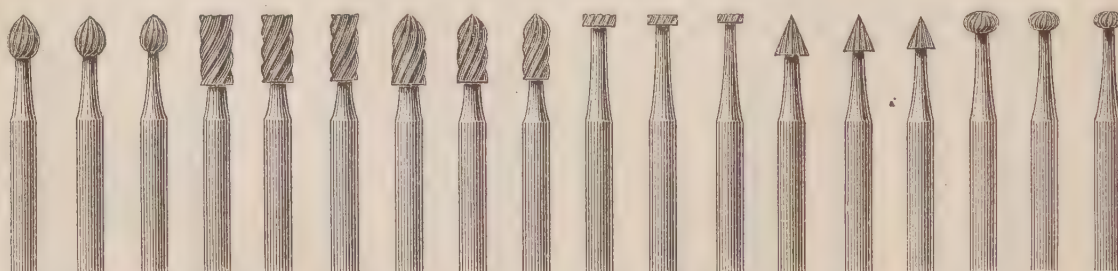
138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159

25 cents each.

25 cents each.

35 cents each.

Extra Sizes of Various Shapes.

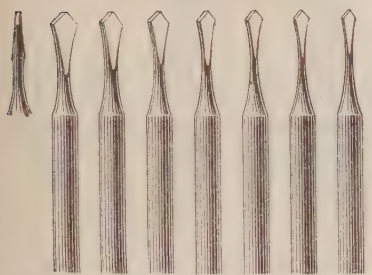


160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177

35 cents each.

CAVITY INSTRUMENTS.

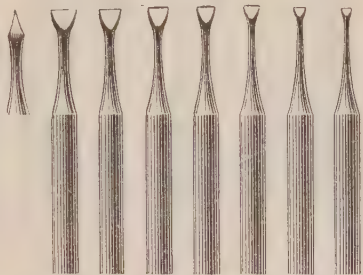
Spear Shaped Drills.



200 201 202 203 204 205 206

25 cents each.

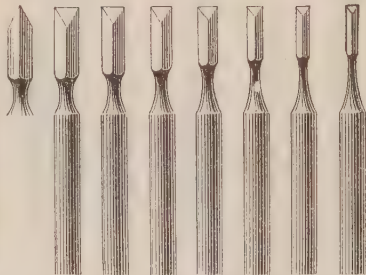
Spade Drills.



207 208 209 210 211 212 213

25 cents each.

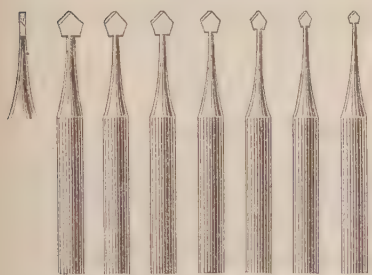
Square Drills.



213 $\frac{1}{2}$ 214 214 $\frac{1}{2}$ 215 216 217 218

25 cents each.

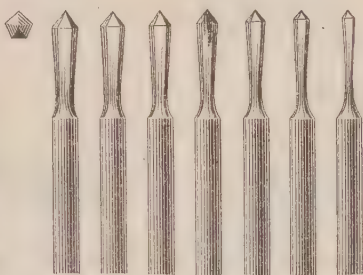
Forbes' Drills.



260 261 262 263 264 265 266

25 cents each.

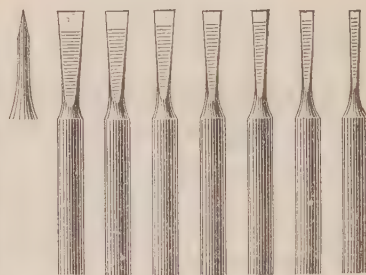
Five Sided Drills.



267 268 269 270 271 272 273

25 cents each.

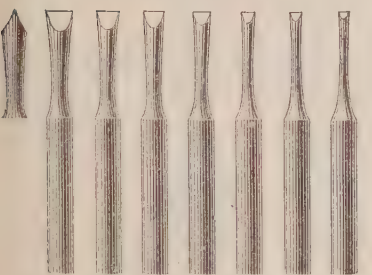
Flat Drills.



274 275 276 277 278 279 280

25 cents each.

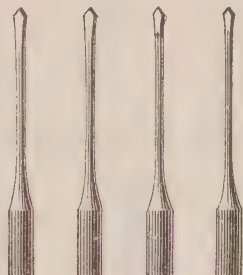
Round Drills.



281 282 283 284 285 286 287

25 cents each.

Drills for Mack's Screws.



288 289 290 291

40 cents each.

No. 291 is for Gold Screw No. 1

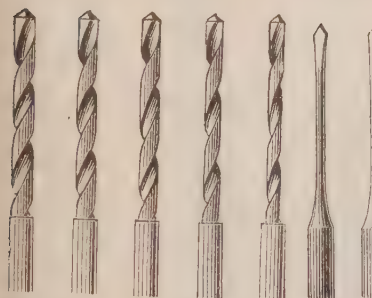
" 290 " " " 2

" 289 " " " 3

" 288 " Pivoting Screws.

NERVE INSTRUMENTS.

Twist Drills.



219 220 221 222 223 224 225

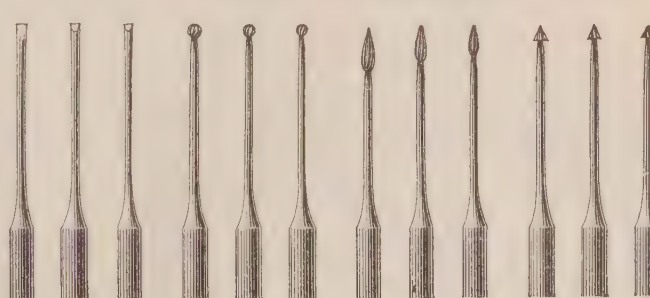
Spear Point Drills

Round Drills

Round Burs.

Flame Shape Burs.

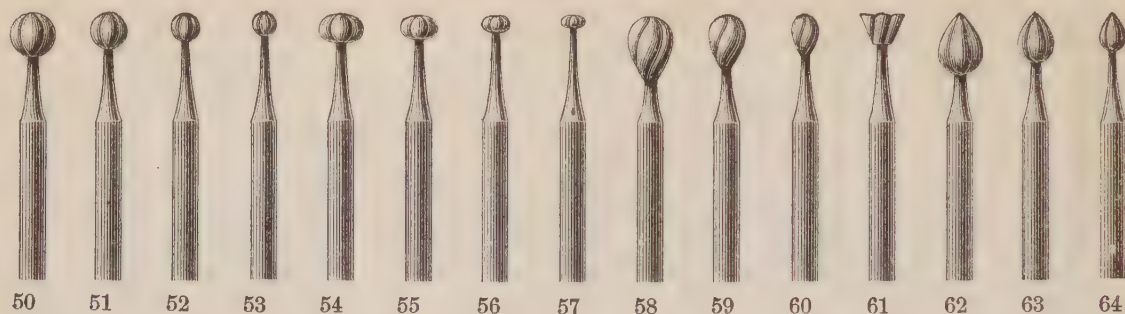
Cone Burs.



40 cents each.

Miscellaneous Finishing Instruments.

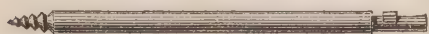
Burnishers.



75 cents each.

Same sizes, not corrugated, 50 cents each.

Screw Mandrel, without Collar.



No. 65.

13 cents.

Plain Chuck for Wood Points.



No. 69.

Plated, 35 cents each.

Plain, 25 " "

Screw Mandrel.



No. 66.

25 cents each.

Port Polisher.



No. 67.

Screw Socket, Nickel Plated, 35 cents each.



Parting Nut Mandrel.

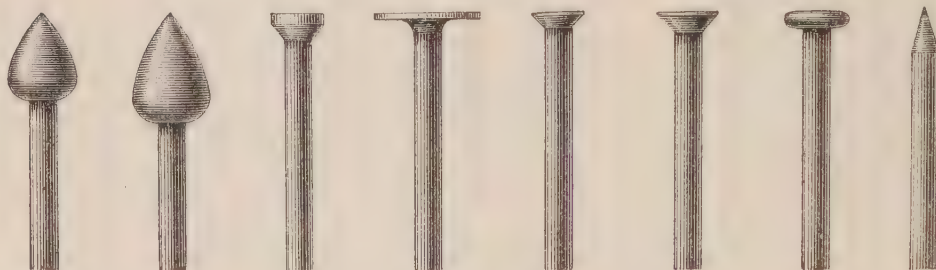


No. 68.

Nickel Plated, 40 cents each.

Plain, 30 " "

Wood Polishing Points.



Per Box of 100, assorted, \$1.25.

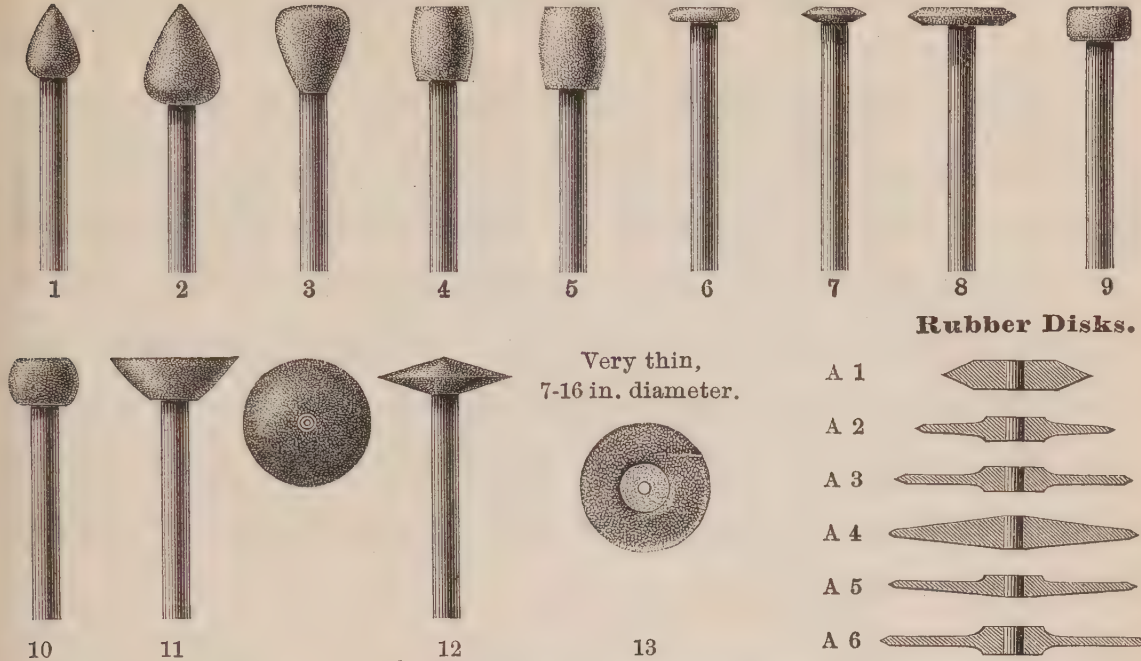
Boxwood Disks.



Price, per dozen, \$1.00.

CORUNDUM POINTS.

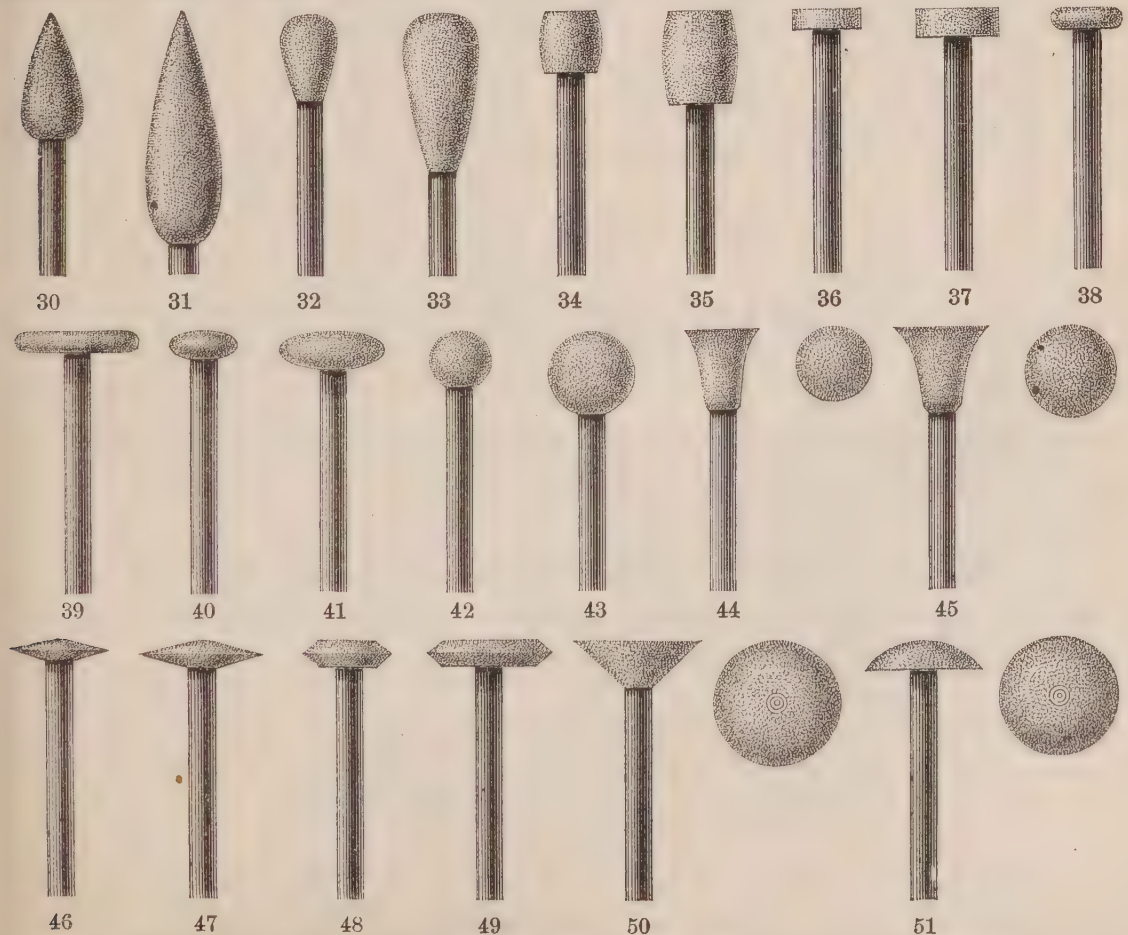
Forms by Dr. A. L. Northrop.



Mounted, per set.....	\$1 50	Wheels as in cut No. 13, per dozen....	\$1 50
Mounted, per dozen.....	1 50	Or Mounted, per dozen.....	2 75
Not Mounted, per set.....	75	Rubber Disks, Hard, per dozen }	1 20
Not Mounted, per dozen.....	75	Rubber Disks, Soft, per dozen }	
Soft Rubber Points, Shapes of Corundum		Points, per dozen.....	75 cents.

ARKANSAS AND HINDOSTAN STONE.

These are kept in stock, mounted on Mandrels, of the forms represented below. Scotch Stones will be made to order of any of the same forms, but this Stone is so soft, that we do not deem them desirable except for such shapes as are without sharp angles.



Arkansas Stones, \$1.00 each. Hindostan Stones, 50 cents each. Scotch Stones, 30 cents each.

STONED BURS.

The teeth of these Burs are laid out with great accuracy, and then filed to *exactly equal length*, but are not brought to a cutting edge. The Bur is next tempered, and each tooth *afterward* stoned to a fine edge. This secures a Bur perfect in all its cutting edges, and unequaled by anything of the Bur kind. Those who have used these most, rarely buy any other kind, and assure us that they find true economy, as well as great satisfaction in their use.

We invite the fullest examination of all of our Engine Instruments, as regards

The quality of the steel from which they are made.

The shape and finish of the cutting edge.

Their temper.

The rapidity with which they cut.

Their durability.

The shaft of each instrument is *round and highly finished*, and can therefore be used without unreasonable and unnecessary injury to the nose of the hand-piece, which injury occasions unsteadiness in all the uses of the Engine.

They will bear examination in *quality and price*.

MINIM BURS.

It is impossible to accurately represent by cuts the smallest sizes of Burs that we make. We offer Cavity Burs, either Round, Inverted Cone, Bud-Shaped, Wheel, Cone-Shaped or Oval, of smaller sizes than are represented or numbered herein. Although more than ordinarily expensive to make, **we keep the price the same as for ordinary Cavity Burs.** In sending orders, please specify the shape desired, as for example: "ONE DOZEN ROUND MINIM BURS."

SPECIAL OFFER.

A discount from list prices of ten (10) per cent. will be given on all cash orders for Engine Instruments which amount to twenty-five dollars or upwards.

PRICES OF ENGINE EQUIPMENTS.

Plug Finishing Burs.....	\$6 00 per doz.	50 cts. each
Extra Size Finishing Burs.....	7 20 "	60 "
Stoned Finishing Burs.....	12 00 "	1 00 "
Extra Sizes proportional prices.		
Excavating or Cavity Burs.....	3 00 "	25 "
Extra Sizes.....	4 20 "	35 "
Stoned Excavating or Cavity Burs.....	6 00 "	50 "
Stoned Excavating or Cavity Burs, Extra Sizes proportional prices.		
Minim or very Small Burs , Round, Bud, Wheel, or Cone shaped.....		
Right Angle Cavity Burs and Drills.....	3 00 "	25 "
Trephines.....		75 "
Screw Mandrels, with Collar.....	3 00 "	25 "
Screw Mandrels, blanks (no collar), for Mounting Wooden Wheels, Leathers, &c.....	1 50 "	13 "
Large Knife Edge Wheel Burs.....		1 25 "
Plate Saws.....		1 00 "
Burnishers, Corrugated.....	9 00 "	75 "
Burnishers, Smooth.....	6 00 "	50 "
Parting Nut Mandrels, Nickel Plated.....	4 80 "	40 "
Parting Nut Mandrels, plain.....	3 60 "	30 "
Drills of all forms and sizes (except Nerve Drills.....	3 00 "	25 "
Nerve Instruments.....	4 80 "	40 "
Leathers, Mounted.....	3 00 "	25 "
Leathers, not Mounted.....	1 00 "	10 "
Bands for Engine, Morrison.....	1 20 "	10 "
Bands for Engine, Suspension.....	1 80 "	15 "
Ive's Tongue and Cheek Protectors (2 sizes), to be used with disks, wheels, &c..... per set.	1 50	75 "
Right Angle Attachments.....		5 00 "
Arkansas Stones, Mounted.....	12 00 "	1 00 "
Hindustan " ".....	6 00 "	50 "
Scotch " ".....	3 60 "	30 "
Corundum Points, Mounted.....	1 50 "	13 "
Corundum Points, not Mounted.....	75 "	7 "
Rubber Disks, hard or soft.....	1 20 "	
Twist Drills.....	4 80 "	40 "
Boxwood Disks (3 sizes, see cut).....	1 00 "	10 "
Wood Socket or Port Polisher, plain.....		25 "
Wood Socket or Port Polisher plated.....		35 "
Wood Socket or Port Polisher, Screw Socket.....		35 "
Corundum Wheel, No. 13, $\frac{7}{16}$ in. diameter... ..	1 50 per doz.	13 "
Soft Rubber Points, shape of Corundum Points.....		75 cts. per doz.
Wood Polishing Points.....		\$1 25 per Box.

We are prepared to furnish any of the instruments illustrated in this pamphlet, adapted to either the A, B, or C style Hand Piece. The C style Instrument also fits the S. S. White Engine.

In ordering instruments, designate them by the numbers, and state whether they are wanted to fit the (A,) (B,) or (C) hand-piece. Each bur is numbered on its shank.

Style A.

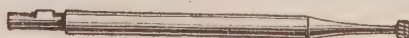


Style B.



Patented Sept. 10, 1872.

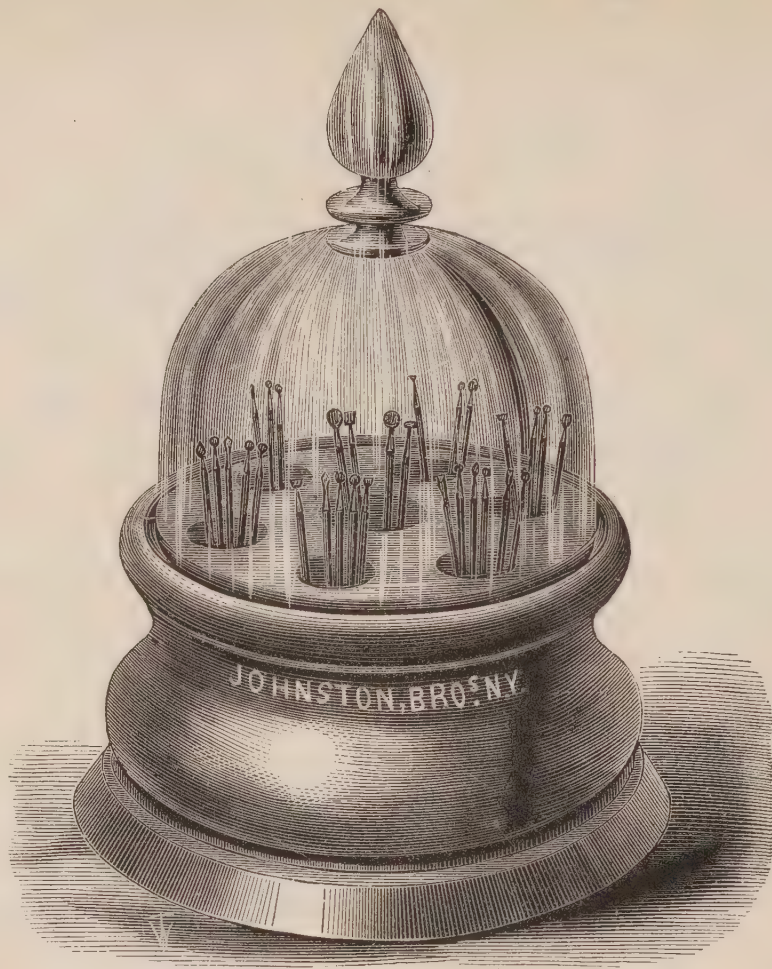
Style C.



Patented Feb. 24, 1874.

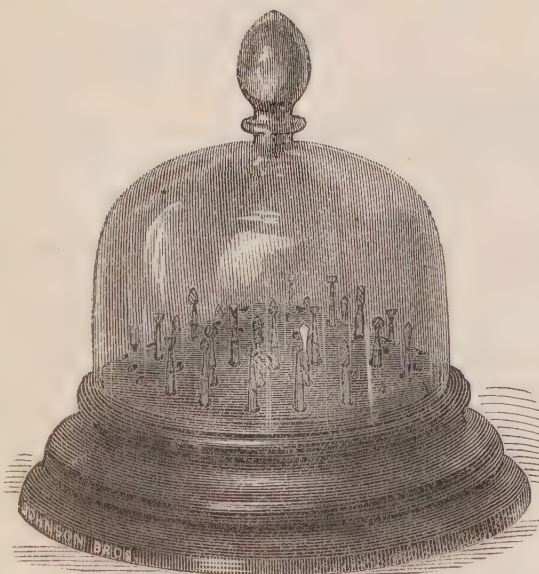
NOTE.—To fasten Burs in the Hand Piece, it is well to push back the catch-spring with the left hand while inserting the Bur with the right hand.

Instrument Stands for Engine Tools.

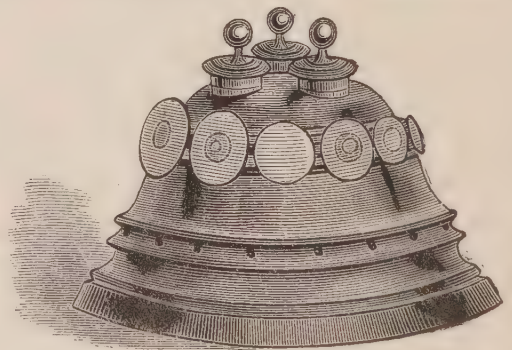


No. 1 as above. **No. 2** with many more, but smaller holes.

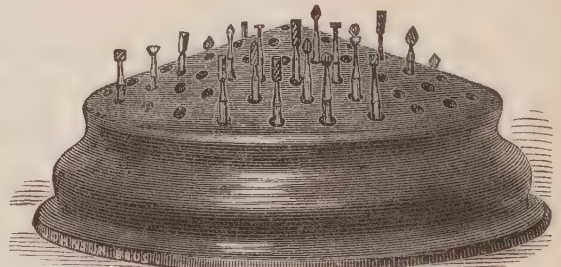
This is made of rosewood and maple in alternate layers, and is very ornamental. Besides the form shown above, we have another like this in all respects, except that the holes into which the burs are placed are made so small as to hold only one or two instruments each. We call this No. 2.



No. 4.



No. 5.



No. 3.

The cuts above show at a glance the advantages offered by these new styles of stands. The conical shape of the top of the bur stand renders it much easier to select and to remove any particular instrument desired than is possible when the top of the stand is flat, because in the first named case each bur is brought distinctly into view.

No. 5, for keeping mounted disks, has been long needed, both on the score of economy and convenience. It is provided at its apex with three stoppered receptacles for polishing *pastes*, each having a brush with which to convey the paste to the buff or wheel with which it is used.

Instrument stands Nos. 1 and 2, are made of alternate layers of rosewood and maple, highly polished, and are hence more expensive than the later styles, which are of black walnut. They are especially adapted for the A and B style burs, but also answer perfectly with C burs.

PRICES.

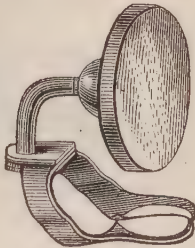
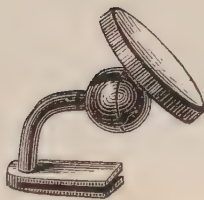
Nos. 1 or 2, complete, each.....	\$2 00
Or without glass cover.....	1 50
No. 3.....	1 00
No. 4.....	1 50
No. 5, having three cups for paste.....	2 90

SPECIAL NOTICE.

We have on hand a small stock of REMODELED MORRISON DENTAL ENGINES, in every respect first quality and new. Having determined to discontinue manufacturing this style of Engine, we offer the present lot, (until further notice) at Thirty Dollars each, net cash. Right Angle, Five Dollars ; boxing, Two Dollars.

REFLECTORS.

[OSBORN'S.]



PATENTED FEB. 16th, 1875.

This reflector is designed to concentrate a strong light upon the cavity. It is so constructed that it can be readily attached to any rubber dam clamp, and by means of a ball joint the mirror can be adjusted to throw light upon any point in the mouth. The operator will readily perceive the great advantage to be derived from this invention in operations upon posterior cavities in molars. The mirror being held in position by the clamp (as shown in one of the cuts), the hands of the operator are entirely free. It is thought that two sizes will meet all requirements.

PRICES.

No. 1, diameter 1/2 in.....	\$2 75
No. 2, " 5/8 in.....	2 75
Set.....	\$5 50

JOHNSTON BROTHERS,

812 Broadway, N. Y.

THE MORRISON DENTAL CHAIR.



**Price \$150.00, or, with Castors, \$160.00. Boxing, \$5.00.
Spittoon Attachment, \$8.00.**

It possesses great superiority over any chair before offered to the profession, and is at the same time less expensive than any other first-class chair. Some of its points of superiority we here enumerate :

- 1st. All the advantages of any low-based chair, and also of any high-based chair, are here secured in a single chair. In it the patient can be placed lower than in the lowest-based chair made, or higher than in any other of which we have knowledge. At its lowest position the seat is fifteen inches, and at its highest position forty-two inches above the floor.
- 2d. The operator using the Morrison Chair can either stand or sit at his work, as he may choose, working with equal convenience in either position.
- 3d. It has been a very general complaint that dental chairs are too wide at the back, so holding the operator away from his work. Here this difficulty is overcome. The chair is narrow at the back, so that the operator need not stretch to reach the patient, but *can lower either arm of the chair out of the way* and so be as near the patient as he may choose.
- 4th. It can be changed from its lowest to its highest position in seven seconds - a celerity impossible in any chair raised by a screw.

5th. It can be very readily and perfectly adapted to operations on children of any age

First. Because in it the child can be raised as high as needed for the tallest operator.

Second. It provides a comfortable back and head rest, exactly as for grown persons.

Third. The footstool can be lengthened or shortened, to suit children of any size.

6th. The back of the chair can be lengthened or shortened rapidly and at will.

7th. The lower part of the back can be thrown forward to support the small of the patient's back.

8th. The chair, when adjusted to any position, is firm or steady wherever placed, and this is *especially true of the head-rest*.

9th. It occupies less room than any other operating chair.

10th. Although the footstool, when at its extreme length, is much longer than any other made, yet a person of ordinary weight can stand on its extremity without tipping the chair.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

We venture to append the names of some of those who have used the Morrison Chair. As the list of purchasers is too long for publication here, we name a few only from each section of the country.

O. A. JARVIS, *New York.*

D. H. GOODWILLIE, *New York.*

O. A. HOUGHTON, *Brooklyn, N. Y.*

A. C. HAWES, *New York.*

W. B. CHAMBERS, *Newark, O.*

C. B. ANSART, *Oil City, Pa.*

M. H. WEBB, *Lancaster, Pa.*

T. W. FRENCH, *Gt. Barrington, Mass.*

E. H. EVANS, *Rockland, Me.*

E. O. SMITH, *Salem, Oregon.*

W. F. LEWIS, *Winona, Minn.*

T. J. McMILLAIN, *Paris, Ky.*

G. W. TINDALL, *Kansas City, Mo.*

A. W. KINGSLEY, *Elizabeth, N. J.*

J. N. SCRANTON, *Bennington, Vt.*

O. A. GLIDDEN, *New York.*

JAMES McMANUS, *Hartford, Conn.*

R. F. BORDEN, *Red Bank, N. J.*

F. A. SHAILER, *Essex, Conn.*

WILLIAM DUTCH, *San Francisco, Cal.*

R. B. DONALDSON, *Washington, D. C.*

B. F. COY, *Baltimore, Md.*

C. P. CLIFFORD, *Lowell, Mass.*

S. H. HINKEL, *Stannton, Va.*

E. G. WHEELER, *Mobile, Ala.*

J. A. DAVIS, *Chicago, Ill.*

C. B. ERICHSON, *New Britain, Conn.*

H. BENTLEY, *West Meriden, Conn.*

H. H. SAYLES, *Elmira, N. Y.*

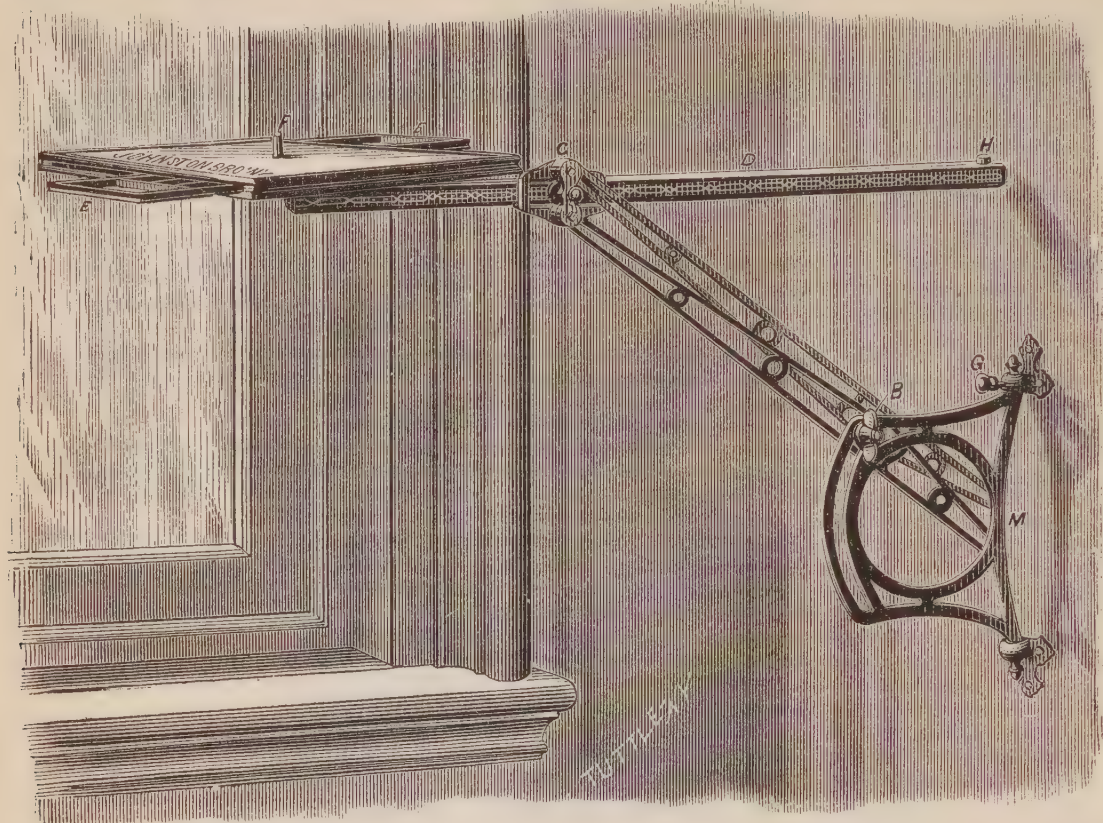
PRESTON DAY, *Warren, R. I.*

E. T. DARBY, *Philadelphia, Pa.*

G. W. TRIPP, *Auburn, N. Y.*

H. B. SANDS, M.D., Surgeon, *New York*

MORRISON DENTAL BRACKET



PRICES.

With Black Walnut Table, 12 inches square.....	\$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather.....	40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket.....	17.00.
Boxing.....	\$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

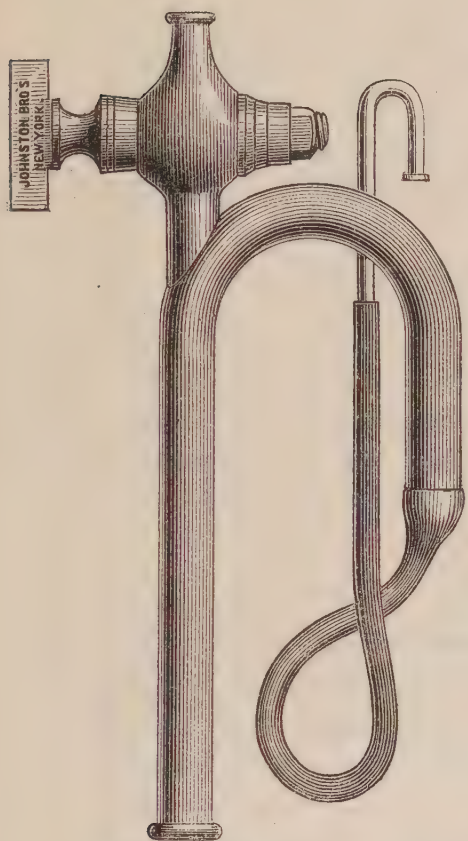
- 1st. It combines a greater variety of range and movement than any other.
- 2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
- 3d. It provides a clean receptacle for foil and instruments.
- 4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
- 5th. Its drawers extend through the table and can be opened from either side.
- 6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

ELLIOTT'S SALIVA EJECTOR.



PRICE \$5.00.

placed in a tumbler of water, the tumbler will be completely emptied in a moment.

Three pieces of rubber tube are required with it as ordinarily used.

1st. A short piece between the supply pipe and the stop-cock. This is sent with the Ejector.

2nd. A waste pipe from the bottom of the long arm to wherever it is desired to discharge the water.

If the Ejector is to be attached to one of the faucets of an ordinary wash-basin, the waste-pipe may be very short, or dispensed with altogether. Price 25 cents per foot.

3d. From the short arm to the dental chair, this tube, as furnished with the Ejector, is four feet long. If a longer tube is needed it can be supplied at 20 cents per foot, on order.

JOHNSTON BROS.,

812 Broadway, New York.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or “chattering” which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

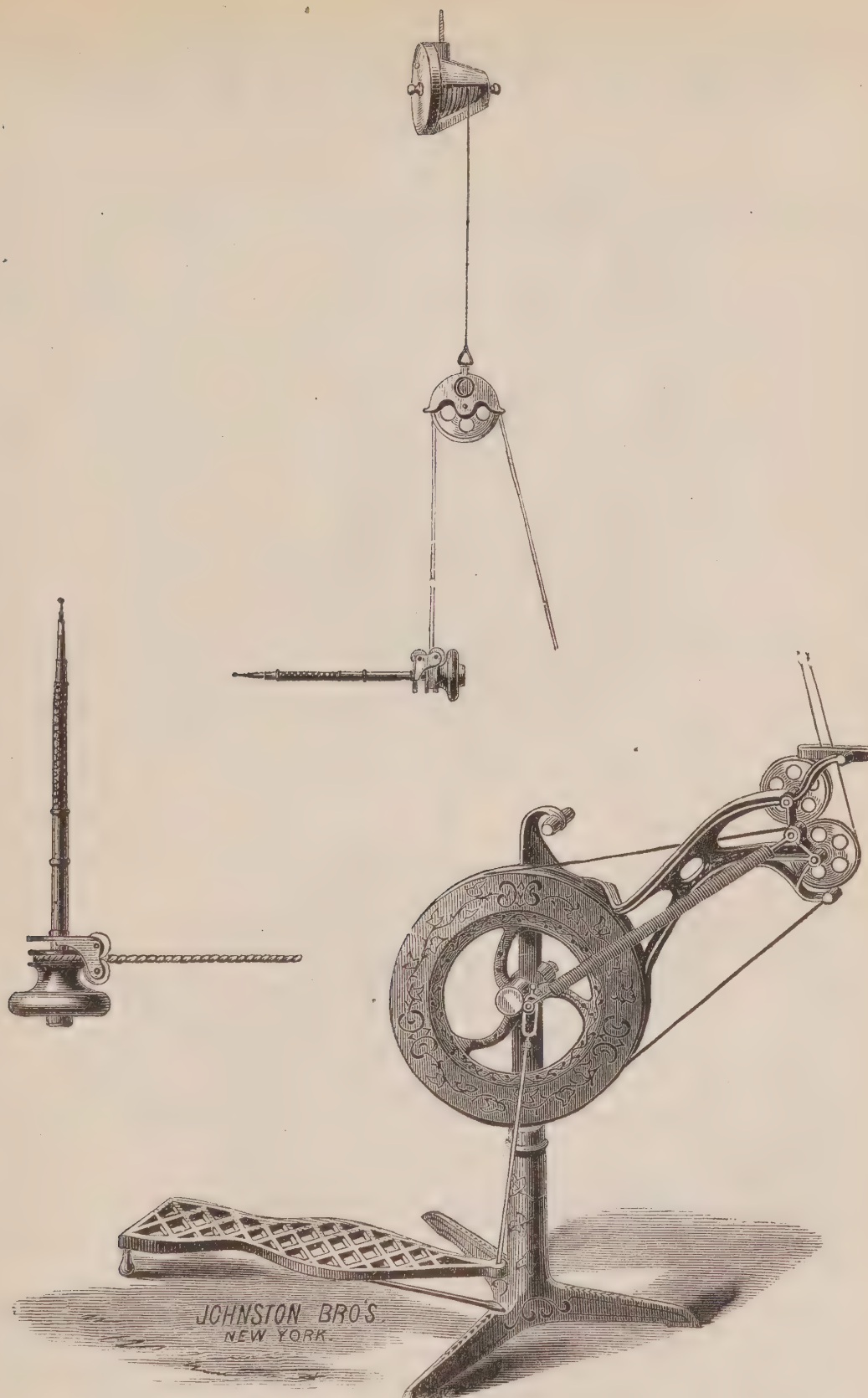
4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a “*light running*” Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROTHERS, 812 Broadway, N. Y.



JOHNSTON BROS.
NEW YORK.

SUSPENSION DENTAL ENGINE.

(DR. ELLIOTT'S INVENTION.)

Price, \$50.00. Right Angle Attachment, \$5.00. Boxing, \$1.00.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($\text{NO}^2 + 2\text{O} = \text{NO}^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid Nitrous Oxide*, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether.....	I	death to 23,204 administrations.	
Chloroform.....	I	" 2,723	"
Mixed Chloroform and Ether....	I	" 5,588	"
Bi-chloride of Methylene.....	I	" 7,000	"
NITROUS OXIDE.....		no Deaths in 75,000	"

Edward R. Squibb, M.D., than whom our country has no more able pharmacist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

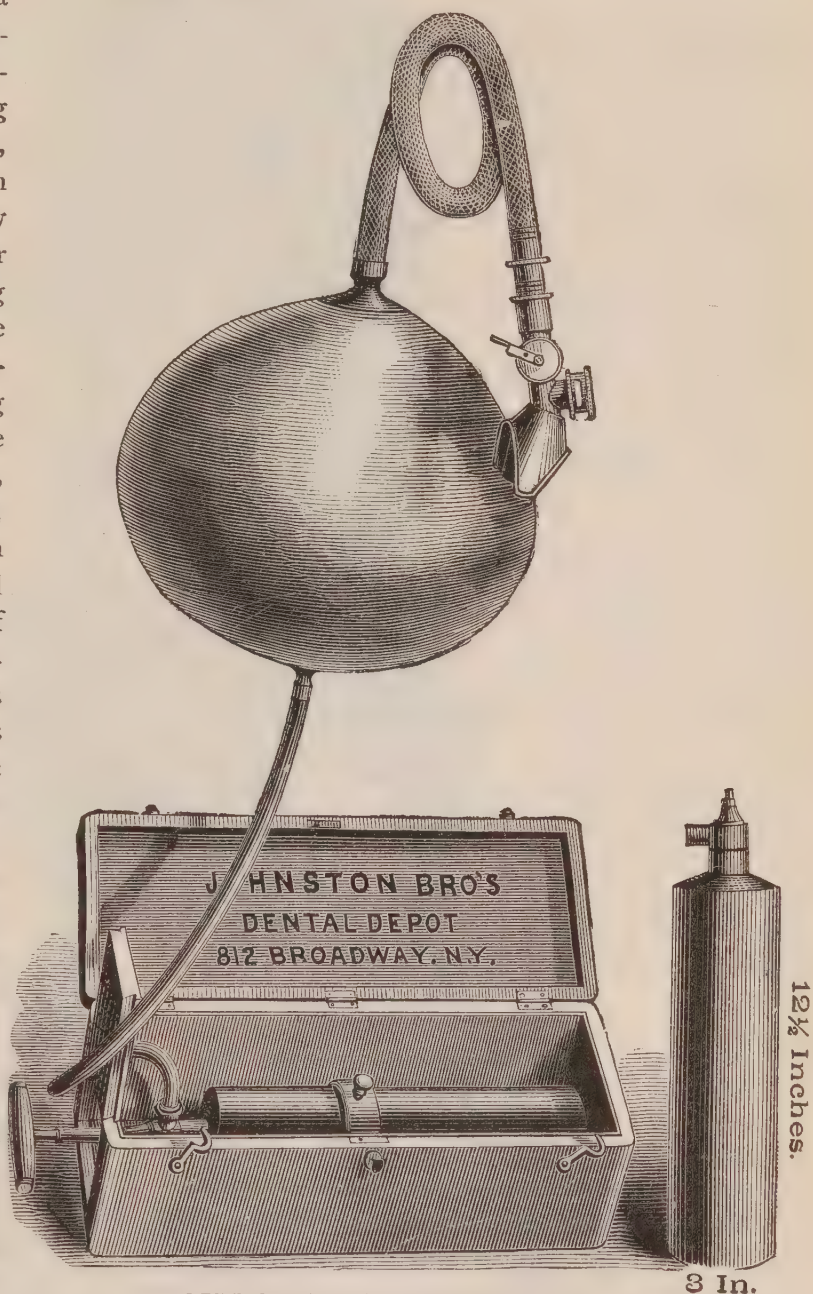
Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

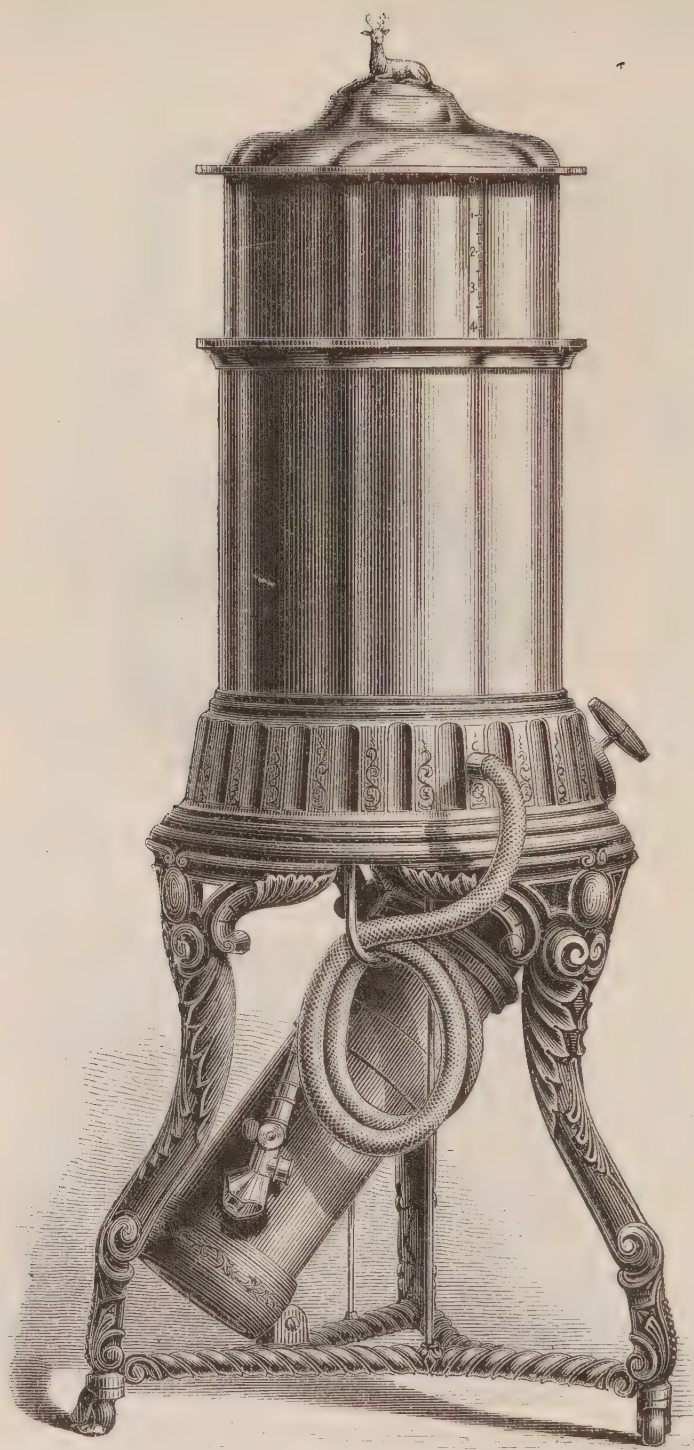
Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers

without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.



NICKEL-PLATED GASOMETER
AND ORNAMENTED STAND
FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas—this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality*.

JOHNSTON BROS., 812 Broadway, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, **the** operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler **No. 1** \$42 00

Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic

Inhaler **No. 2** 45 00

Boxing either, \$1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas 16 00

Refilling Cylinder 6 00

Nickel-Plated Gasometer, with ornamented iron stand 128 00

Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered

Tubing) 12 00

1000 Gallon Cylinder 36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of 4½ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at 4½ cents. 45 00

Morocco covered case, with ring and thumb screw, velvet lined 12 00

Polished bl'k walnut “ “ “ “ “ 13 00

Of these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity) 5 00

Rubber Bag, with covered inhaler tubing, extra size 7 00

Inhaler, latest style, with two way stop cock, adapted to the use of both dentists

and surgeons, with connection 9 50

Key, Nickel Plated 1 50

Wrench, “ “ 50

Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag 1 50

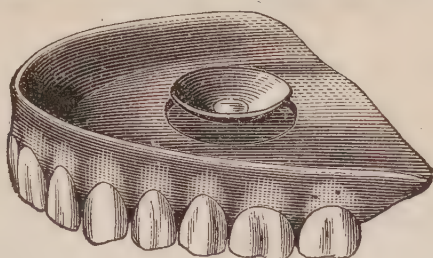
Covered Inhaler Tubing, per foot 50

Plated Connection to fit old style Inhaler 1 00

JOHNSTON BROS.,

812 Broadway, N. Y.

NEW PATENT ATMOSPHERIC DISK.



FOR HOLDING ARTIFICIAL TEETH FIRMLY IN PLACE

In Eating, Talking, Laughing, Singing, Coughing or Sneezing.

The undersigned offers to the dental profession this new and valuable device for retaining base plates securely in the mouth. Its utility has been demonstrated in over five hundred cases in my own practice. I believe it must come into general use, as no patient will dispense with it after a trial of its advantages. The Patent bears date of January 24, 1871, with seventeen years to run. Office, Town, County, or State rights for sale. Those desiring to test the disks practically before purchasing, can secure the necessary materials, ready for use, for six cases, with full instructions, by sending P. O. Money Order for three dollars.

Office rights for the full term.....\$40 00

“ “ “ one year 10 00

Those purchasing rights for one year will be given rights for the balance of the term for \$30 more, if they choose to continue after the year has expired.

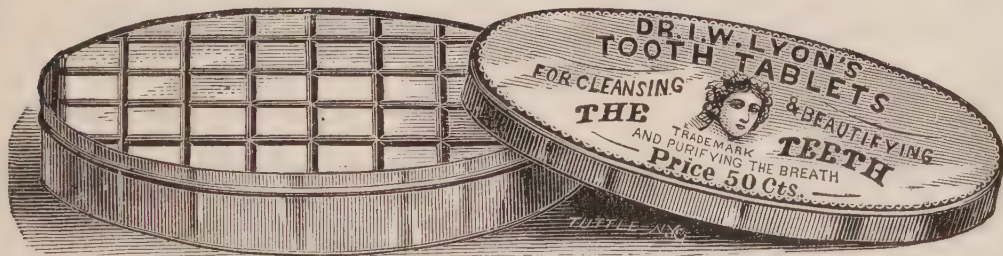
Address

DR. QUINCY A. SCOTT,

Lock Box 1,015, Pittsburgh, Pa.

DR. I. W. LYON'S

TOOTH TABLETS.



NOTICE—CHANGE OF BOX.

I have dispensed with the pasteboard box formerly used in putting up the TABLETS, in consequence of its liability to breakage, and have substituted a SEAMLESS METALLIC BOX, which is impervious to air and moisture, and may be carried on a journey without danger of breaking, thereby preserving the TABLETS perfectly.

Confident that the change will be duly appreciated by the patrons of LYON'S TOOTH TABLETS, I am, respectfully,

I. W. LYON, D.D.S., Proprietor,

36 Vesey Street, New York.

SOLD BY DRUGGISTS AND DENTISTS GENERALLY, AND AT THE DENTAL DEPOTS.

"Premium" Gutta Percha Stopping.

It will not be disputed that a filling which offers the following properties, is sure of a hearty welcome by both dentist and patient.

"Premium" Gutta Percha Stopping,

1st.—Is thoroughly plastic, but not sticky; in this respect an improvement on previously offered Gutta Percha.

2d.—It is very nearly the color of the tooth.

3d.—It adheres tenaciously to the walls of the cavity, and so protects the tooth from decay. Osteoplastic fillings frequently fail, by disintegration around the margins of the cavity, and admit moisture to the seat of previous decay.

4th.—It does not work "salvy," and by sticking to the *warmed*, (but not *hot*,) instrument by which it is applied, drag itself from the position in which it has just been placed—a common fault with Gutta Percha hitherto.

5th.—It is non-escharotic, and so may be used directly over an exposed nerve, which cannot be safely done with the most used "soft fillings."

6th.—It is a non-conductor of heat, and hence will not transmit thermal changes, from a cold draft of air, or from hot or cold food to the under-lying nerve. In this it is superior to the best metallic fillings.

7th.—It is readily removable by proper instruments, when used as a temporary filling, more readily than either amalgams or cements.

8th.—It can be used in cavities having frail walls, or where the tooth is sensitive, since very little force is required for packing it.

9th.—It hardens promptly.

Although used ordinarily as a temporary filling, instances are numerous where a Gutta Percha filling has lasted ten or twelve years. We think a variety can be made which will have sufficient hardness to make it fit for permanent fillings.

(OVER.)

PREMIUM GUTTA PERCHA.

Read what is said of it by those who are using it constantly:

25 West 23d St., New York, Feb. 18th, 1876.

MESSRS. JOHNSTON BROS.:

I think our profession owe a debt of gratitude to those experimentors who are instrumental in perfecting instruments, materials, implements, &c., for us, and as evidence of my own appreciation beg to add my testimony in favor of your Premium Gutta Percha Stopping. *I like it much.*

Truly yours,

J. G. AMBLER.

Norwich, Conn., Feb. 16th, 1876.

MESSRS. JOHNSTON BROS., New York,

GENTS: I have thoroughly tested the Gutta Percha filling prepared by you, and must say it is the best compound of its kind for filling teeth I have found in twenty years' practice.

Yours respectfully,

S. L. GEER, Dentist.

Aiken, S. C., Feb. 17th, 1876.

MESSRS. JOHNSTON BROS., 812 Broadway, N. Y.,

GENTLEMEN: I have used your "Premium Gutta Percha Stopping" ever since its introduction, and with much satisfaction. I have been successful with it as a filling for root canals and as a non-conductor near the nerve in deep-seated cavities; but regard it more highly as a filling for children's teeth, believing it to be not excelled for that purpose.

Yours respectfully,

B. H. TEAGUE, D.D.S.

MESSRS. JOHNSTON BROS.,

Springfield, Mass., Feb. 24th, 1876.

DEAR SIR: I have been using your "Premium Gutta Percha Stopping" for two months, in place of Hill's Stopping. It is much harder than the latter, and I hope will prove more durable. I need a longer time to test its comparative value, but shall give it the preference over any other preparation of Gutta Percha I have ever tried until fully tested.

Yours truly,

F. SEARLE.

1418 Washington Ave., St. Louis, Feb. 19th, 1876.

MESSRS. JOHNSTON BROS.,

GENTLEMEN: In reply to yours of the 15th, I most willingly attest to the merits of your Gutta Percha Stopping.

As a protection to pulps from thermal changes it is a perfect insulator; as a stopping it serves a perfect purpose; and protected from mechanical violence is indestructible, while its facility of manipulation renders it additionally desirable.

Yours truly,

EDGAR PARK.

New York, Feb., 1876.

GENTLEMEN: I have given your Premium Gutta Percha Stopping a reasonable trial, sufficient to convince me of its durability, and of the many other good qualities of which it is possessed. I therefore highly recommend it, not only for temporary, but also for a great many permanent fillings.

Very respectfully yours,

W. S. BEDELL, Dentist.

St. Johns, Newfoundland, February 29th, 1876.

MESSRS. JOHNSTON BROS.,

GENTLEMEN: You ask for my opinion of your "Premium" Gutta Percha filling, and I'm glad to say I can recommend it. If you remember, you sent me a sample a few weeks since. I've used it several times, and have been pleased to find an absence of all ropy and sticky tendencies. It manipulates beautifully; in fact, it's just the thing we've been wishing for as a temporary stopping. Please accept our thanks.

Very truly yours,

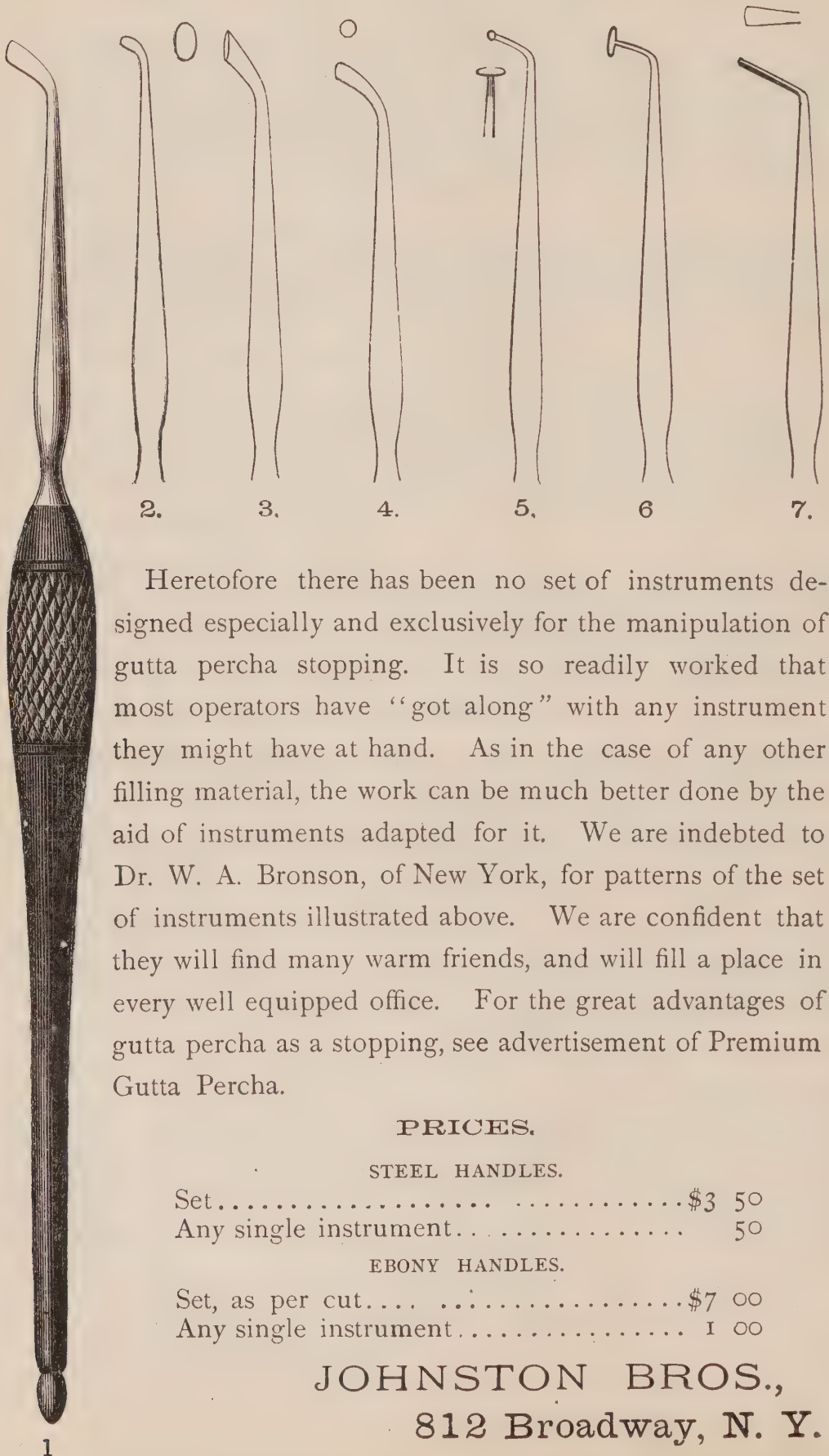
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The regular examinations will be held in the following order, viz.: At the end of the first year, anatomy, including dissection, physiology and general chemistry. A certificate from the demonstrator of anatomy will be required of each student, that he has satisfactorily dissected the three parts of the body.

At the end of the second year, dental pathology, including a knowledge of gestation and diseases of women so far as they affect the mouth and throat, dental materia medica and therapeutics, oral surgery and surgical pathology, operative and mechanical dentistry. The examinations in operative and mechanical dentistry will include actual operations and the preparation of specimens of mechanical dentistry.

Every candidate must be twenty-one years of age, and of good moral character; he must give evidence of having studied medicine or dentistry three full years; he must have spent at least one continuous year at this school, have presented a satisfactory thesis and have passed all the required examinations.

The University Degree, D.M.D. (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfil the requirements.

Students may be admitted to advanced standing upon passing a satisfactory examination in a majority of the studies already pursued by the class; but no student shall advance with his class or be admitted to advance standing until he has passed such examination.

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There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is \$200; for the second year, \$150; for any subsequent year, \$50.

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Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June. *Fall Preliminary Lectures*, commencing Monday, September 4th, will continue daily until November. Like the Spring Course, their object will be to anticipate subjects presented during the Winter Session. *The Regular Winter Course* commences Monday, November 6th, and closes on the last day of February ensuing. Three hours of each day will be devoted to attendance upon lectures, which will be illustrated to the fullest extent by a large and valuable collection of Chemical and Philosophical apparatus, and Anatomical and Pathological specimens. Tickets for the Course, including the Demonstrators', \$100; Diploma, \$30; Matriculation (paid but once), \$5. For further particulars address

J. H. McQUILLEN, Dean, S. W. Cor. 21st and Arch Sts.

—1876—

JOHNSTONS' Dental Miscellany,

A NEW MONTHLY JOURNAL

OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

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The commendation of the Miscellany received during the last year has gratified its publishers greatly. They purpose to make the volume for 1876 superior in all respects to either volume that has preceded it. This will be—

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2d. By the further reproduction of engravings upon dental subjects. Three such have already appeared, and others are in course of preparation.

3d. By the constant search for, and publication of items of office practice, which serve to show the methods adopted by eminent and experienced dentists to overcome the little perplexities of every-day practice, and to shorten the operations in both laboratory and operating room.

In short, it shall be the constant effort of the editor and publishers to make the Dental Miscellany of practical value to every actively employed dentist, as well as a source of literary enjoyment to its scientific readers.

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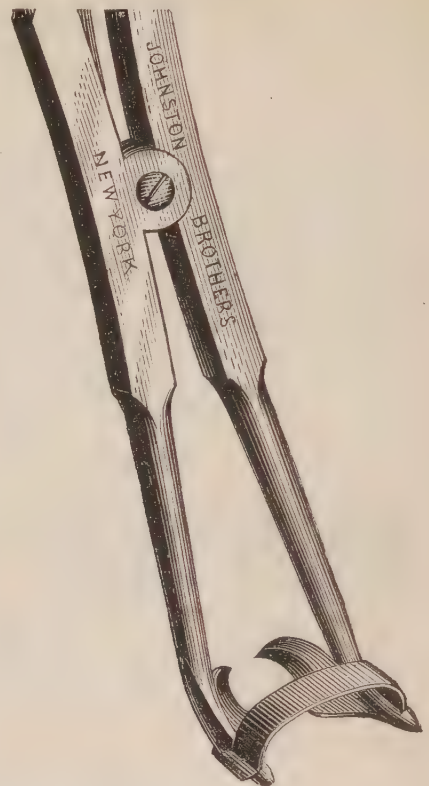
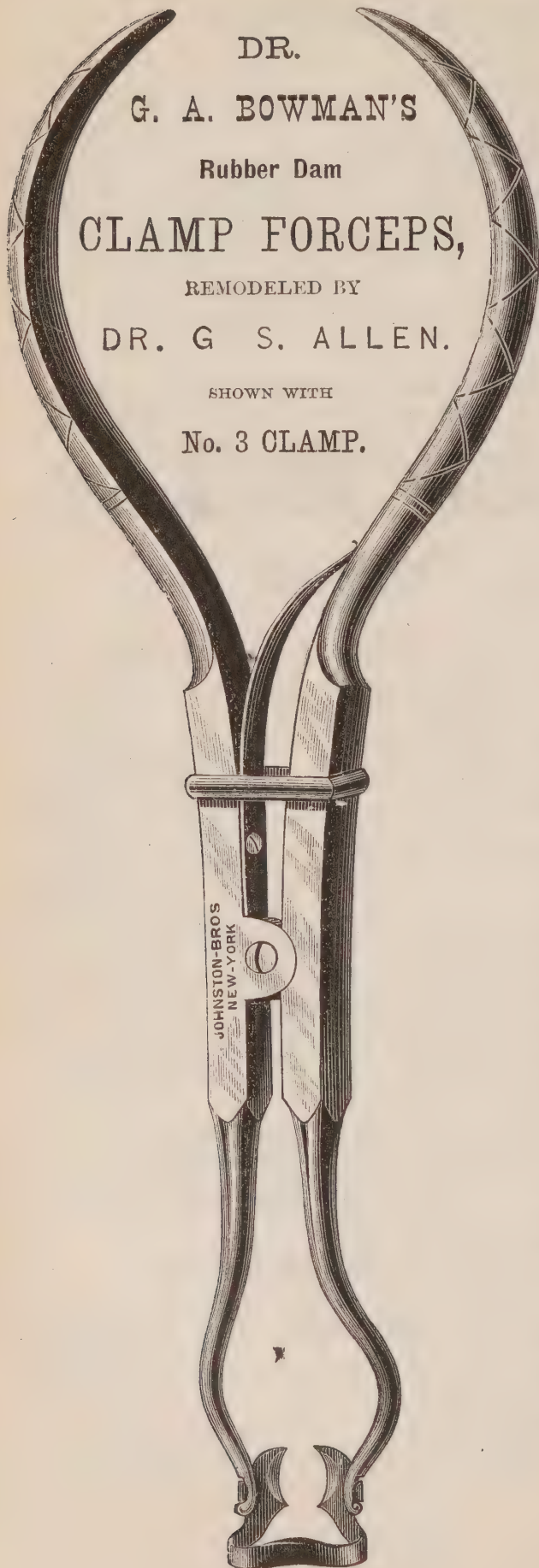
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Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

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PRICES.

Forceps, either style	\$3.00
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Complete set of Clamps, embracing eight forms.....	4.00
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Clamps, each.....	50
“ plated.....	60

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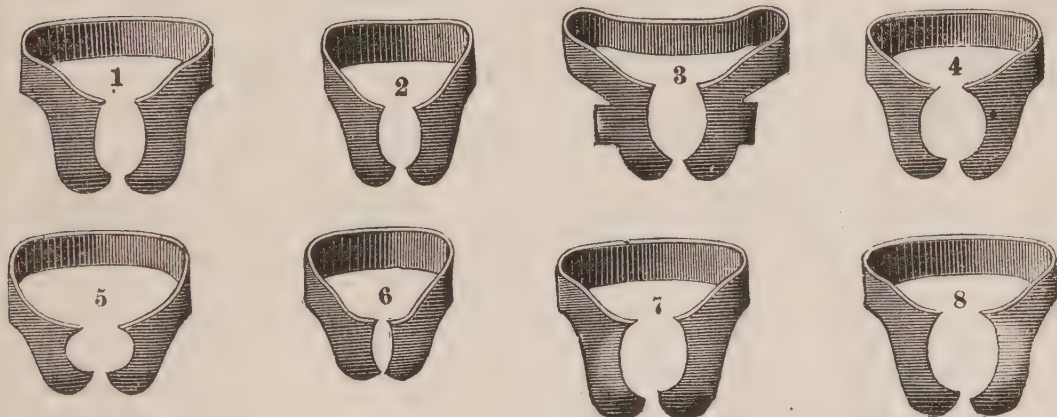
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INVENTION OF

DR. DELOS PALMER, OF NEW YORK.



Price, set of Eight,	{ Oil finish, \$4.00.	Each plain, 50 Cents
	{ Nickel plated, 4.80.	" Nickeled, 60

For use with Rubber Dam Clamp Forceps.

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No. 6.—For lateral and central incisors.

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Cuts of two favorite styles of Rubber Dam Clamp Forceps will be found on another page.

These Clamps have prominent points of marked superiority over those of other manufacturers.

First. Each has been carefully adapted to the shape of the tooth for which it is designed, *under the personal supervision of Dr. Delos Palmer*, the inventor.

Second. A groove is made by us in the clamp, into which the forceps nicely fit, so that the clamps firmly hold their position on the forceps, when once adjusted, instead of tilting from one position to another—as is the case when no groove is provided.

JOHNSTON BROS.

Johnston Brothers' Head-rest.

PATENTED SEPT. 14, 1875.

The cut above—drawn one-third size—shows the Johnston Head-rest as adapted to the Morrison Chair. It has been in use in several offices for something more than a year and has fully met the anticipations of those who have used it. A careful examination of the illustration will convince all that in range of movement it is vastly the superior of any head-rest in market. In the cut, I, represents the vertical bar of the Morrison Chair, which supports the head-rest. It slides up and down just back of the cushions of the chair. As the new head-rest requires a special form at the top of this bar, a new bar will accompany each head-rest ordered for a Morrison Chair. By this head-rest every desirable position of the head can be rapidly and easily secured, and the patient made comfortable in it.

The parts are fastened firmly where wanted by the motion of a *single clamp*, as in the Morrison head-rest.

The feature especially distinguishing this head-rest from every imitation of it is in the method of fastening or clamping its moving members. Where this is done by the thrust of a screw, against a single point in a moving part, the slightest loosening of the screw allows the free movement of the whole affair, which may then become entirely unmanageable. In *this* head-rest the clamps all *encircle* the rods on which they rest, and hence, when slightly loosened, there is sufficient friction to prevent too rapid or uncontrolled movement. The padded cushion will support the jaw during operations upon it, and at the same time afford a comfortable rest for the cheek of the patient. It, too, is arranged to better accommodate ladies' hair than usually head-rests can do.

A and B, are two clamps swiveling on each other, and encircling the rods, C and D. By one movement of the clamp, F, the padded rest, H, is held firmly in any position in which it may be placed. The rod which is fastened by G moves vertically, and admits of a range of several inches without disturbing the back of the patient.

C can also be turned to the right or left so as to stand parallel with the back of the chair, and secure a perfect position for the head of a round-shouldered person. C, and the parts above it, are handsomely nickel-plated. The padded rest is here shown in a position rarely used, only because it is a position that enables the artist to clearly represent all of its parts. Orders will be booked on the date they are received, and be filled in rotation within a short time. Persons ordering a Morrison Chair before this head-rest is in market will have their order filled as usual, and if they afterward elect to have a Johnston Head-rest it will be sent without further charge than the established difference in price. The price will be established as soon as the cost of manufacture is ascertained.

JOHNSTON BROTHERS,

812 Broadway, N. Y.

RECOMMENDATIONS.

JOHNSTON BROS.,

New York, March 6th, 1876.

DEAR SIR: I have been using the Morrison Chair for about two years, and found some objection to the head-rest, but since using the Johnston head-rest in connection with the same find it to be everything that could be desired. This new head-rest is undoubtedly the best I have ever seen. By its use I am able to place the patient's head in every desirable position, and with perfect ease to the patient and operator.

J. BOND LITTIG.

JOHNSTON BROS.,

New York, March 8th, 1876.

GENTLEMEN: After a careful examination and practical test of your new head-rest, I take pleasure in saying that I believe the movements to be admirable and ample. It is pleasing in appearance, and the only one which will accommodate ladies' hair. Also, the rest it affords for the side of the head is a very desirable feature.

Respectfully,

O. A. JARVIS.

MESSRS. JOHNSTON BROS.,

Washington, March 8th, 1876.

GENTLEMEN: I have been using the Johnston head-rest for several months, and like it *very much*—indeed, I consider it the *best* head-rest I have ever seen. You will undoubtedly confer a benefit upon the profession if you introduce them at a moderate price.

Very truly yours,

R. B. DONALDSON, D.D.S.

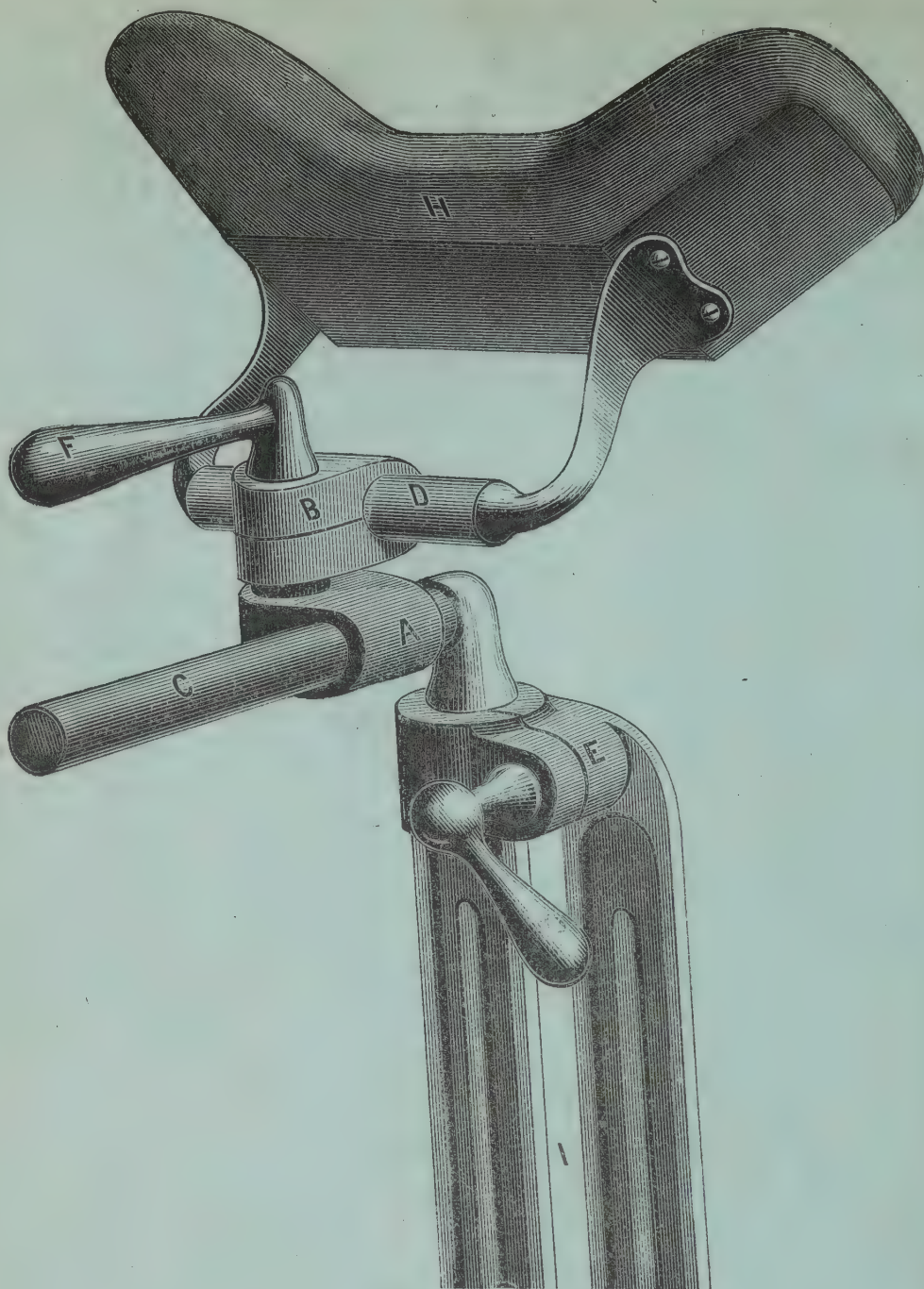
MESSRS. JOHNSTON BROS.,

Sag Harbor, N. Y., March 8th, 1876.

GENTLEMEN: I have been using the Johnston head-rest adapted to the Morrison Chair since June, 1873. I have operated with about every known head-rest, and have no hesitation in pronouncing it far superior to any, embracing every movement desired, and can be changed to any position instantly. I consider it the *best* head-rest yet invented, nor can I see room for improvement. I cannot say too much in its praise. Any dentist once using it will never part with it, and thank the inventor and the Messrs. Johnston for supplying so valuable an aid to the operator.

Very respectfully yours,

THOS. O. OLIVER.



N E W

JOHNSTON HEAD REST.

FOR

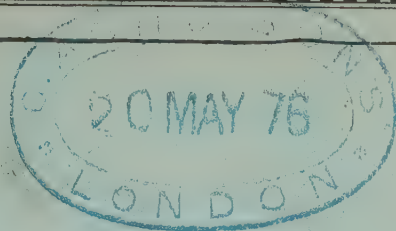
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For Description see Advertising Pages preceding.

JOHNSTON BROS.,

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VOL. 3.



No. 28.

Johnstons' Dental Miscellany,

A MONTHLY JOURNAL OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

APRIL, 1876.

NEW YORK :
JOHNSTON BROTHERS,
812 BROADWAY.

JOHNSTON'S DENTAL MISCELLANY,

FOR 1875.

It is certainly reasonable cause of self-congratulation on the part of the publishers of this Journal, that the end of the first year of its publication finds it with a large and constantly increasing list of subscribers, and that they are constantly in receipt of letters of encouragement and commendation from their readers in every section of the country, and even from distant portions of the world, one such letter being recently received from Japan.

We are promised one or more articles from each of the following gentlemen of established reputation, and others of like standing in the profession have encouraged the expectation of like favors from them.

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Dr. WM. H. ALLEN, New York.
Dr. J. B. MORRISON, St. Louis.
Dr. W. C. BENNETT, New York.
Dr. A. H. BROCKWAY, New York.
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JOHNSTON'S

Dental Miscellany.

VOL. III. — APRIL, 1876. — No. 28.

CASE OF IRREGULARITY.

By N. W. KINGSLEY.

The following described case of irregularity possesses some features in common with others which have been illustrated in this journal, but the causes and treatment are so different as to make the subject worthy a separate description.

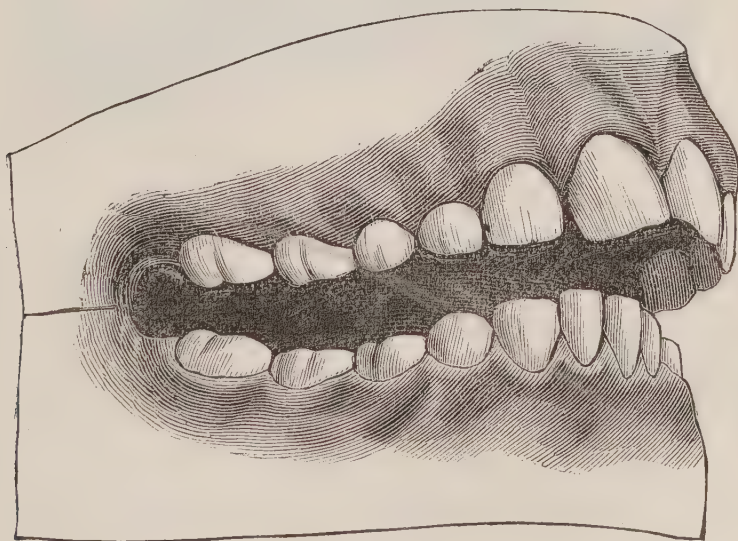


FIG. 1.

Figure 1 shows the cast of the teeth of a lad ten years of age, sent to me from some distance in the country.

I speak of this fact because it is not uncommon for dentists to send

me plaster casts, and ask me to indicate a line of treatment and describe an appliance suited to the correction of the deformity, not realizing that I am utterly unable to form a definite opinion from so limited a knowledge of the case as a plaster model usually gives.

The case here illustrated is a fair example. From a study of the casts, I should have been likely to have come to the conclusion that the superior dental arch had been brought forward through some effort similar to thumb-sucking, and that the treatment demanded a reduction of the upper arch. The presence of the lad, and a study of the external features, showed that the upper teeth were but slightly at fault, and that the profile of the face was altered by a retreating lower alveolar and dental arch rather than a protruding upper one.

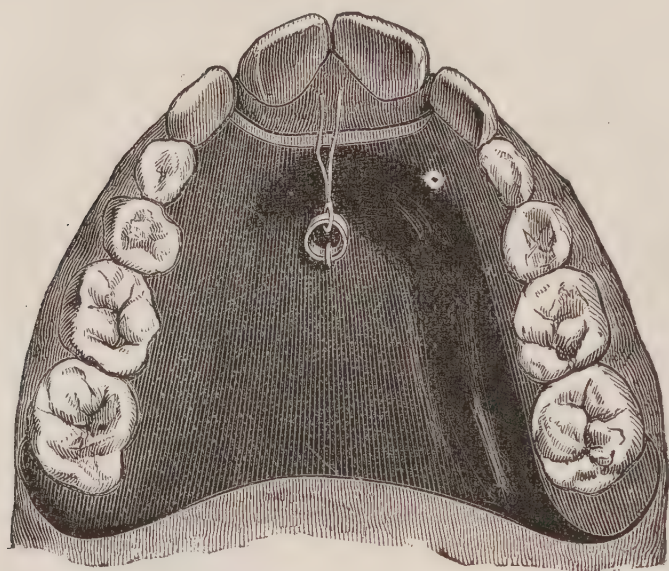


FIG. 2.

The upper arch was broad and well formed ; the lower was narrowed as well as depressed.

The profile of the face was good except the lower lip, which was so sunken as to suggest the absence of teeth on the lower jaw, while the chin was not retreating and showed a harmonious relation to the other features.

The treatment was the adaptation of an appliance to each jaw—for while there was no marked deformity of the upper jaw, nevertheless the pitch of the incisors would be improved by a slight reduction.

The fixture for the upper jaw is shown in Fig. 2, and consisted of a Vulcanite plate as here illustrated, with a rubber ring through which a

stout thread was passed and the elastic drawn forward to the lingual surfaces of the incisors. A bit of the stump of a match stick a quarter of an inch long was laid horizontally across the two centrals, and the thread tied over the stick.

Upon the lower jaw there were not as yet any bicuspid nor permanent canines—the only teeth here shown belonging to the permanent set are the four incisors and the first molar. The regulating fixture is shown in Fig. 3. The vulcanite plate has gold spurs projecting be-

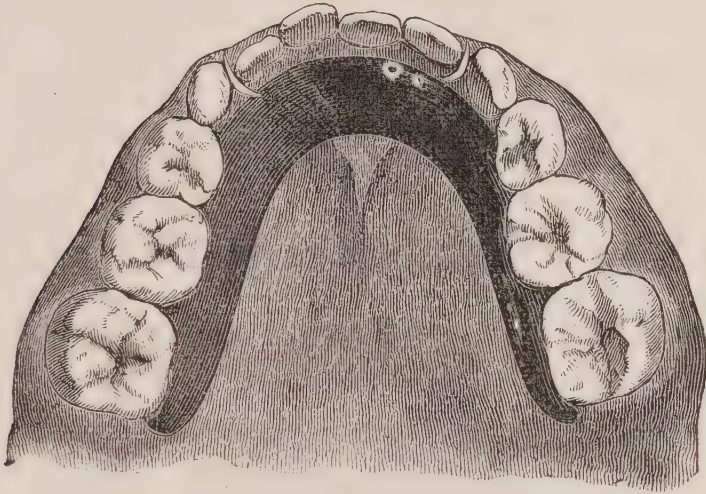


FIG. 3.

tween the incisors and canines. These spurs were inserted to keep the incisors from spreading on the line of the arch. Wedges of elastic rubber were then inserted between each tooth, and between the teeth and the spurs. This operation drove the teeth forward in two weeks so that, with the reduction of the upper arch, which was simultaneously accomplished, the upper and lower incisors came in contact. The retaining plates for each jaw were similar to the regulating plates, only adapted to the changed positions of the teeth, and were continued in place for a number of months.

The lower plate, as shown in Fig. 3, was made wider across the mouth than the cast would receive, and was sprung into its place.

The tendency was to spread the arch, which it did, so that when the permanent teeth erupted they developed a broader arch than existed before and one which corresponded better with the upper one.

This case is but one of the many which show the necessity of a personal observation of the patient's external features as well as the mouth, in order to an intelligent treatment.

LETTER FROM SWITZERLAND.

EDITOR JOHNSTONS' DENTAL MISCELLANY :

SIR :—The questions of Dental Reform, Dental Education, Professional Advancement, and the discussions about the Status of the Dentist, are perhaps as vigorously pursued to-day as in the earlier days of the history of Dentistry. The pioneers in our profession could not have been more earnest in their labors for the elevation of their chosen calling, than are the accomplished dentists of 1876. English and American journals teem with essays and reports of discussions on this subject. The physician, the medical man or the surgeon, ranks very well, socially, morally and intellectually in America, and the American dentist strives for a like respectable position. The mechanical department of our profession seems to be the principal barrier to the desired position, and American and English dentists have urged a separation of the two branches of the dental art. I will not here enter into this discussion, but will only state my belief that this projected separation would avail nothing toward the desired end, but would tend rather to produce a contrary effect. For when we are asked as dentists to lay aside our hands, and employ only our brains, we cease to become dentists. As well ask the painter, or the sculptor, to simply design, or to tell people *how* to perform what the master's hand alone can do. Of course we need not perform all the purely mechanical laboratory work, but the dentist should not be above knowing this menial work thoroughly. The reform needed to elevate us to the rank of a profession, may lie rather in our "fee bills." Is it according to the ethics of a learned profession to have a "fee bill," "a scale of charges," or whatever it may be called? If we charge a fee of so many shillings or dollars for this operation in amalgam, so many for this in gold, so many for this case of two artificial teeth, and so many, in a graduating ratio, for this other case of six or eight teeth, are we not copying rather the customs of trade, and of the mechanics, than of a liberal profession? Shall we measure our "*work*," and sue for it before a justice, by rule, as a mason or plumber would? Here, I think, lies the difficulty in our profession, and it is not in the labor of our hands that we are degraded. The Continental physician presents no bills. He sends his compliments, at the end of the year, and a list of the number of visits he has made you. You give him according to your means or his known reputation, more or less, and this physician must look upon the dentist

as one who is not governed by the same professional ethics—for how could he conclude to send bills, as: “For one case of measles, treated with diaphoretics, so much; one case of gout, so much; total, so much”? If the dentist receives a fee of a certain amount per sitting, no matter what the operation may be, the code of ethics would certainly be observed; but, perhaps, if he retained a trace of avarice in his composition, the influence might be bad on himself and the operation; for it would take a very disinterested and almost superhuman mind to continually give many times the value of the fee in service; and if gutta-percha or gold operations were rewarded alike, the tendency would be to employ rather an excess of gutta-percha. In New York and some other cities, the *time system* has been adopted, and the case of Mr. Peacock, in England, showed that some dentists have adopted the same system there. This method would hardly be advisable for the mechanical or artistic part of the profession. If we would elevate the standard we must adopt some method in our fees compatible with the customs of other liberal professions. This brings me to the question which I should like to propose. Is it in accordance with our aspirations to have for distribution, *cards* with “Professional Fees,” “List of Prices” or “Dental Fees,” inscribed or neatly printed on their backs? I have in my drawer many specimens from prominent American dentists, of these cards. Some are very explicit and expose the charge for “devitalizing the pulp,” “removing tartar,” “treating of abscess,” etc., etc. As most of these cards have the names of eminent practitioners, successful dentists and successful money-getters upon them, the question has often arisen whether it is not a paying advertisement and rather a genteel system of advertising, and I must acknowledge that I have been tempted to go and do likewise. Once, indeed, after great study, I edited a card of this kind and had some printed, but the distaste for advertising prevented me from issuing a single one to my patients or to brother dentists. The more I considered the subject, the more I felt that the modest looking “*fee bill*” savored of the cards in the public prints—though of course not so disgusting as: “Dr. Bunkum—having devoted thirty years to researches in the study of dentistry, etc., etc., inventor of the suction system (?)—teeth at five francs”—still the flavor was similar. I should like to be set right if wrong, but until we modify the commercial aspect and the tradesmen’s customs of our character as a profession, we had better not try to cast odium on the mechanical and artistic department of dentistry.

C. M. WRIGHT.

Basel, Switzerland.

"UNDER WHICH KING, BEZONIAN?"

[SHAKESPEARE.]

By PROF. THOS. H. CHANDLER.

Men of active and progressive minds, the dentists of the present day are peculiarly prone to run to extremes. Some genius promulgates a thought which perhaps has lain undeveloped in the minds of many others for a longer or shorter period, and it is at once seized and carried to its utmost verge by these and those who swear by them. After a lengthened trial a doubt is suggested as to whether the new way is so very good after all, and if it has not been a little hasty and unwise to abandon the old and well-worn path, and away all start to find it again.

The first process has already taken place in the matter of the use of gold for plugging teeth, and the reaction is now going on. Our magazines are giving evidence of the course of the current in the articles advocating the use of soft foil, and describing the processes of A., B. and C., who of course do wonderful things with it, and never meet a failure. Now, before the pendulum has swung to its utmost point on the back track, I will venture to put out my feeble hand to stop it, or at least to so retard its motion as to keep it from becoming precipitate. If soft foil has such marvelous properties as are now being claimed for it, why did the fathers of dentistry seek any change? Was it not because they became conscious in their working that there were inherent and unconquerable defects in it which rendered it desirable that there should be something else found, free from such defects? Hence the discovery of amalgams and of the gutta-percha fillings, and finally of the cohesive qualities of gold itself.

I will venture the assertion that, in the days of soft foil, of all the gold fillings made, a very large majority were imperfect, because it took a mechanical genius to work it always successfully, and that thousands of teeth, such as are now saved by the use of cohesive foil, were sacrificed, even by the best men, from utter inability so to work soft foil as to save them. I will also venture the assertion that much of the best work of the best men of that time was done with cohesive foil, that being one of the secrets so jealously guarded by them. I have had this acknowledged by some of them, and I have removed and examined plugs made by them, and know that such work could be done by nothing else. Furthermore, I assert that with all the faults of cohesive gold there is more good work done to-day in proportion to the amount, and

there are more workers above mediocrity proportionately than in the best days of soft foil. It is easier to be a fair workman now than then. Now only a good share of common sense is necessary to make fair work ; then an approach to genius was required. With the soft foil the appearance of the results gave no encouragement to the lazy or the dull ; nobody could take pride in the looks of the rough, lustreless gold, as nowadays in our hard, shiny gems ; hence a large amount of conscience was needed to keep such men up to their work. It is only within a couple of years that Mr. Fletcher, of Warrington, England, whose name has been so freely used in the amalgam question, gave utterance to the assertion that cohesive foil fillings could not be made tight. This was enough. Give a dog a bad name, etc. Those who "knew all about it," swarmed like the seventeen year locusts at their appointed time—"now none so poor to do it reverence." Why is this thus? The principle of making tight fillings with either soft or hard gold is the same essentially, viz., packing against the walls, and the reason so many cohesive foil fillings fail is because this method is abandoned and the gold packed parallel to the walls with the mallet. Attempts are made to fire around corners, to hammer under-cuts, and many other impossible feats, ignorant or heedless of the fact that the effect of a blow is always in a straight line. One might as well endeavor to shoot around a tree with a crooked nail as to try to strike a curved blow because the instrument is curved. If persistent hammerers would drop the mallet now and then, and use hand pressure, packing in every direction, the blue look of their work after a few months would not make them look or feel so blue when they happened to discover the fact. A proper eclecticism is the only safe way. No running in ruts nor riding of hobbies. "Truth lies between extremes." Try all, choose the best. But if one can do first-class work after any method, he had better think twice before he decides to abandon it for another, especially if he has turned that point in life where new ideas are implanted with difficulty, like the seeds on the rock, drying up and withering away. Habit is stronger at this period than nature, and however clearly the mind may see the road, the feet persistently refuse to follow it, and if forced to tread it, their steps are unsteady and infirm, leaving no track another would care to follow. If one has reached this period without yet knowing how to do good work by any method, God pity him ! No change will do him any good but that last change which puts him out of all his trouble, and saves his patients much of theirs.

ADDRESS DELIVERED AT THE TENTH COMMENCEMENT
EXERCISES OF "THE NEW YORK COLLEGE OF DENTIS-
TRY," FEBRUARY 21, 1876.

By PROF. FANEUIL D. WEISSE, M.D.

GENTLEMEN, GRADUATES OF THE CLASS OF 1876: I congratulate you upon having within this half hour received the well-earned reward of your long labors. You are now of the Alumni of the New York College of Dentistry by virtue of her Diploma; which Diploma entitles you to the confidence of the community at large and the respect of professional men. You at this moment stand with the door of professional life open before you, and as you now turn from the field of your college work to enter upon the stern realities of that life, I, as spokesman of your *Alma Mater*, wish you a sincere God-speed.

It is the custom of the Faculty of this college, on occasions like the present, to designate one of their number to deliver a few parting words. To me has fallen this year's fulfillment of the custom, and so I must lecture to you once more. It is a pleasant and yet a most painful task; pleasant in that it affords me the opportunity of addressing you all again, painful as it is saddened with the reflection that it is more than probable we shall never all meet together again. What I shall have to say will be burdened with words that shall part us from all those pleasant ties which have bound us as teachers and students.

Your respective Diplomas attest that each of you is a Doctor of Dental Surgery; with that title you each assume duties to be fulfilled. The title in your hands demands of you that each maintain its dignity, as designating a professional man, who is not only a thorough master of all the technique of the specialty of Dental Surgery, but also one who is qualified, as a specialist in surgery, in all the fundamental departments of general medicine. The calling upon which you have entered has, for the past forty years, been struggling bravely and honorably to take its stand with the acknowledged specialties of the healing art. She has won it, and it is owing to the successful establishment of institutions like this of your *Alma Mater* that it has been accomplished.

I do not desire to flatter you, or to trumpet your merits, that they may reflect to the advantage of the N. Y. C. D., when I unhesitatingly say—and it affords me more than pleasure to say it—that I am fully convinced that there is not a professional man in the length and breadth of this

land, M.D., D.D., or L.L.D., but would—after reading and hearing the searching written and oral examinations to which you have individually submitted during the past fortnight—extend to you as specialists of Dental Surgery the hand of professional fellowship. Thus you stand to-night, but will you still deserve that position ten years or even five years from now?

The mind, that is its organ, the brain, like the muscle, requires to be fed, and to be actively functioned in order to maintain a given standard of acquired development. As the idle muscle wastes and loses power, so the idle brain allows the rivets of the links of memory to rust, and knowledge, however thoroughly acquired, drops away link by link from its possessor as surely as flows the sands through the inverted hour-glass.

Each of you has more work before him in the garnering of professional knowledge in the future—if you do your duty to yourselves, your specialty and your *Alma Mater*—than would be required to acquire fifty diplomas.

Hold fast the habits of study which you have acquired during your period of pupilage. Do all the practice you may be called upon to do, but remember to find time to read, to write and to think. Impart freely to your professional brothers any information you may have, but in doing so remember the sharp distinction made by a contemporary English surgeon, when speaking of medical writers and speakers. He makes two classes of each of them—“those who write *for* practice, and those who write *from* practice; those who speak because *they have something to say*, and those who speak because *they want to say something*.”

In the seclusion of the office you will be often asked as to the professional ability of this or that man—say nothing if you have nothing good to say. Remember—especially if it should be of one who, being your senior and of the last generation, has not received a degree—that because you are fortunate in living in an age of Colleges, it ill becomes you to disparage the merits of those who, availing themselves of the meagre advantages that their day afforded, have nevertheless merited the confidence and respect of the community. The hardest work of your lives is to win and maintain that which they have won with far less qualifying influences.

Respect the pioneers of your profession with all the enthusiasm you have, and defend their shortcomings as seen in the light of your day with all the zeal of which you are capable. To them you owe your present position as graduates, for by their example the want of the spec-

ialty was made evident, and when the time and the hour arrived, it was the influences which they set in motion, that led to the establishment of Dental Colleges ; thus bequeathing to your generation a harvest of educational facilities, which, like Moses and the promised land, they were forbidden to enjoy, and could only look at afar off.

Now that you have been received into the ranks of dental college Alumni, you must needs be interested to know something of the growth of these institutions. In 1840, the first college was opened : the Baltimore College of Dental Surgery. In 1844, the Ohio College of Dental Surgery in Cincinnati appeared in the field. In 1856, the Pennsylvania College of Dental Surgery was organized in Philadelphia, and in 1863, the Philadelphia Dental School. In 1865, the Missouri Dental College was established in St. Louis. The same year, 1865, also saw the N. Y. College of Dentistry chartered, but her first regular session commenced in the fall of 1866. In 1867, two schools opened in Boston and one in New Orleans. In 1873, a second College in Baltimore, and school in Texas were initiated. Lastly, in 1875, the University of Michigan established a Dental department. To-day there are twelve institutions in our land devoted to the education of men for the specialty of Dental Surgery.

Your *Alma Mater* was the sixth daughter of this progressive advance, which demanded that a period of two years should be devoted to the practice and study of a dental and medical curriculum, before admission should be granted to the ranks of that which had been raised to the dignity of a profession by virtue of the degree conferred. In future there should be required of those desirous of entering the ranks of the specialty a thorough familiarity with all the details of dental operations and dental mechanism ; together with a knowledge of the fundamental departments of medicine—such as Anatomy, Physiology, Pathology, Chemistry, Materia Medica and Therapeutics.

In some of the States of the Union laws have already been passed prohibiting any to practice Dental Surgery without a degree. And to-day, state and national educational authorities recognize the degree of D.D.S. as a medical degree.

Your *Alma Mater* closes the first Decennial of her active work to-night. In 1866 she organized her collegiate and practical departments. The practical department is the Dental Infirmary—which was opened with a double purpose; as a public charity, and to afford opportunities for practice to the classes.—It is open all the year round; all the operations are performed by the students under the supervision

of qualified Dental Surgeons, and during the past ten years upwards of 40,000 patients have been treated.

At the collegiate sessions, some 260 students have matriculated for upwards of 400 college terms. Of these pupils are representatives of nearly all the nationalities of Europe and the Western continent ; from Russia to Spain, from Chili to Canada, and from twenty-three states of the Union have they come. One-quarter have been foreigners, and of the total two-thirds have been strangers to the State of New York.

The 93 graduates who have gone before you, are widely scattered over the face of the earth—England, France, Prussia, Austria, Russia, Spain, Egypt, Canada, Chili, Brazil, U. S. of Colombia, Cuba, Hayti, and more than half the States of the Union have our representatives.

A few hours and you too will be parted, going to all points of the compass. Before you go, I have to say to you: Bear high your degree, and live up to the highest standard of professional culture! Affix the D.D.S. to your name on all occasions, so as to educate the communities in which you may practice as to its meaning. I speak of this because I know of many who hold the degree who do not use it, because they say people do not understand what it means. How is a community ever to learn what it means, if those who have a right to use it, persistently continue to keep it out of sight?

To-night you must take a long farewell of all that endears you to your professional home. You will linger often in the future on this incident or that experience of your college life, but in the face of duty before you, these scenes will grow dim on the horizon. To-night you each take the helm of your life's voyage, and from your present outlook nothing appears before you to indicate "the color of your future years." Your *Alma Mater* has piloted you through the treacherous harbor of professional apprenticeship, and you now, like the outward bound steamer, ride safely on the brink of a broad ocean. Already your pilots have descended to their craft alongside ; a single rope now holds them to you. As the cheery word comes up from the pilot's craft to the deck of the steamer, so we hail you: May your voyage of life be prosperous, and may you be safely anchored in the haven of professional success !

ADDRESS BY PROF. D. D. SMITH, D.D.S., AT THE COMMENCEMENT OF PHILADELPHIA COLLEGE.

GENTLEMEN GRADUATES : The time has been when the event we call "Commencement"—the closing exercises of the course of study, the true beginning of professional life—was an occasion of more general interest than from the multiplication of scientific callings and its consequent frequent recurrence it can ever be again. Once it was a time of general rejoicing and festivities, not uncommonly attended by a grand pageant, making a holiday in which all, old and young, the erudite and illiterate, felt it a privilege to participate. But, although no especial pomp or parade marks the present hour, to each of you just commissioned to begin legitimately the duties of your chosen calling this event is as singular and as triumphant as though the eyes of a curious world were now beholding the transactions of this assembly. Nor would it be more singular or more triumphant if you alone of all mankind were recipients of this distinction. Speaking on behalf of my colleagues, on behalf of this honorable Board of Trustees, and of these many friends whose presence adds to the enjoyment of this occasion, I extend you most hearty congratulations that your efforts have thus been judged successful ; and with equal good-will I welcome you to the honors, toils and pleasures of the dental profession. Here it might be pleasant, even appropriate, to linger and twine the moments that remain with memories of the pleasant past or with words of praise, but life's duties, with all their solemnities and importance, are waiting just without the door. The poet has said :

"Time is the warp of Life : O teach
The young, the fair, the gay, to weave it well !"

To you, gentlemen, in these altered relations, with new hopes, new plans, new aspirations, these are moments of the highest import. Upon the resolutions of this hour may rest your future destiny. The spirit that inspires you now may influence or control your whole lives. Do you receive this bit of parchment, which proclaims to the world that you are thought competent to enter upon the practice of our profession, as the end and goal of your ambition, and having gained it do you think to bask henceforth in the noon-tide sun of ease and contentment? Then these honors shall be to you a curse, and this hour shall mark the meridian of your professional usefulness. Do you

look upon it as one step well and securely taken, as one point surely gained? Do you regard it as does the anxious traveler, still pressing onward, the post which marks the mile, as only an evidence of a portion of the journey passed, while you look forward to greater distances and greater heights beyond? Then the honors of this hour shall be to you a blessing that shall strengthen and cheer you through all the coming years of toil, and you shall look back from other scenes and other attainments to this occasion as a pleasant and refreshing incentive in a career of honorable progress. It were better that these diplomas were torn to shreds or delivered to the flames than that in gilded hangings upon the wall they mark for one of you a goal reached, an ambition satisfied.

“He that to ancient wreaths can bring no more
From his own worth, dies bankrupt on the shore.”

Not for your own sakes alone are you enjoined not to rest satisfied in the present; the good of the profession demands it as well. While it has been markedly successful and is still rapidly advancing, the profession of dentistry has not attained a position where it can spare one of its graduates to a life of ease. It has not reached a point where it can afford to send from its college doors a single drone; not one man undesirous, unresolved to contribute for its benefit. Were we to answer the question, “What does dentistry most need?” we should answer, “Men”—men devoted to its interests; men ready to sacrifice personal ease, unworthy ambition, and love of gain for its good; men to investigate; men to help its schools and advance its literature. Give it such men and its capabilities shall unfold, its usefulness shall extend until not a department of the healing art shall be productive of greater good to the suffering millions. Let us for a few moments consider what men and education have already done for dentistry. Dental colleges were the outgrowth of a long-felt need. How shall young men be educated to meet the increasing demands for greater qualifications, was for years the important question pressing for solution at the hands of dentistry. Private preceptorship had been tried, and proved utterly incompetent to perform the work. Under the most favorable conditions this system was sending its subjects out upon the world untrained in habits of thought, often unacquainted with the simplest theories and modes of practice, without ability to weigh opinions or to break the bounds of the narrow circle trod by the teacher before them. Medical colleges were yet more incompetent. Dentistry as a speciality of medicine was completely ignored by them. Entire courses of lectures were delivered

in them, without the promulgation of a rational theory of the cause, effect, or treatment of a single pathological condition of the teeth. That they are parts of the human organism, complicated in structure and relations, more subject to disease than other organs, in intimate association with the centre of life, important agents in inciting disease in other parts, leading not infrequently to intense suffering and the abridgment of human life, were matters of which no cognizance was taken. Standard medical works taught and still teach theories exploded, and the application of remedies abandoned by dentists twenty years. Every day evidence was accumulating showing the unfitness, the inability, of medical schools to furnish to dental students the information which should fit them for the duties of dentistry. How, then, should this work of education be accomplished? The establishment of independent schools seemed alone to offer a satisfactory answer. With a full appreciation of these facts, a few self-denying, resolute men, in 1839, in the city of Baltimore, organized and set in motion a system of college instruction for dentists, with the power to confer upon graduates an appropriate degree. The undertaking encountered difficulties and discouragements which would have utterly overwhelmed any similar enterprise not founded in actual necessities. Destined however to live, we see it struggling through the prescribed course of study, and as the first fruits of a new profession, graduating three men, upon whom was conferred the title of Doctor of Dental Surgery. This effort to fix some standard of education for those commencing the practice of dentistry, and to bring together its then heterogeneous, discordant elements—this effort to elevate by education what might be appropriately termed the then trade of dentistry to its rightful sphere, and make it of value to mankind, was looked upon as presumptuous by the medical profession, was ridiculed by many dentists whom it was to benefit, and was passed unnoticed by the thousands already suffering at the hands of incompetency. But those efforts put forth in weakness have in thirty-seven years attained a commendable if not an enviable strength. Professor Oliver Wendell Holmes, at the first commencement of the Harvard Dental School, said: "But this commencement has a real significance, though it makes little show and does not appeal to any vulgar interest. It publishes the fact that a new pursuit has been assigned its place among the chosen professions which a fully organized educational institution may fitly take in hand and provide for teaching." Is this, then, a truth? Was it Harvard College in 1872, or was it the Baltimore College of Dental Surgery in

1839, that published the fact that a new pursuit had been assigned its place among the chosen professions which a fully organized educational institution might take in hand and provide for teaching? A teacher of philosophy was once examining a student upon the relation of cause and effect, and asked him, among other things, if he ever saw an effect precede a cause? "Yes, sir," said the student. "Will you instance a case?" "Yes, sir; a man coming after a wheelbarrow." If dentistry was not assigned its place among the professions until Harvard University provided for teaching it, then we had the effect years before the cause. Is it not rather significant that medical schools are so ready and willing to step in now and assign dentistry a place among the chosen professions, to take it in hand and provide for it? It is said that a member of a certain fashionable church once inquired of a music dealer for "Solomon's song," adding, by way of explanation, that his minister had spoken of it as a production of great genius, and he wished his daughter to sing it! So medical teachers, failing to discover the true position of dentistry, have ever seemed to think that it had place with melodies to be sung at pleasure, and are but just awakening to the fact that it is written in original investigation, and set to the measured notes of advancing science. From the little cloud in 1839, scarcely so large as a man's hand, have come benign influences, broadening and expanding, until to-day there is not a civilized nation of earth where its benefits are not seen. Then dentistry as a whole scarcely took rank among the honorable trades; to-day it is justly classed amongst the honorable professions. Then its practitioners were craftsmen; to-day many of them are gentlemen of culture and scientific attainments. Then it was a conglomerate and unorganized mass of men, each seeking to conceal his ignorance; to-day it is a body of generous men, organized into societies for mutual improvement, and having in the United States alone eleven schools of learning empowered to confer its special degree. Then it was scorned by the medical profession and unnoticed by the world; to-day it is treated with respect by the whole medical fraternity, and accorded its justly important position as a department of medicine by the broader cultured and more conspicuous in all the professions. Then it was composed largely of men schooled only in secret formulæ and mysterious arts; to-day it is composed of men schooled in science and trained in the art of benefiting mankind. Then it was without resources or appliance; to-day it is possessed of large resources, and is rich in the most ingenious and appropriate appliances. Then it was without literature, neither

had it authority ; to-day it has a respectable and rapidly increasing literature, and authorities as clear and fully pronounced as are the same in medicine. Then it was full of envyings, jealousies and backbitings ; to-day its code of ethics is as dignified and exacting, and the intercourse among its members as unselfish and genial, as the same in any other profession. These, gentlemen, are the contrasts between the times when dental colleges were first established and now ; and these are the changes which have been wrought in dentistry by the spirit infused into it through their establishment. But in drawing these comparisons I would not be understood as claiming the dignity, culture and importance for all that bears the *name* of dentistry that I have ascribed to the educated portion ; neither exclude from almost reverential mention that galaxy of names—Harris, Flagg, Brown, Gardetti, and others who labored so unselfishly for the advancing of dentistry years before dental colleges were in existence. Do I hear some one query, “Are we not all in the same boat?” Let me reply, in the language of Jerrold, “Yes, but there’s a difference in the skulls.” Much remains to be done, and the work needs individual as well as associated effort ; and, as with all advancing movements, young men must come to the front prepared to bear the larger burdens. As “a little leaven leaveneth the whole lump,” and as the desire for improvement is so general and widespread, I think we may confidently look to the near future as a time when no man shall presume to appropriate the name of *dentist* unless it be by virtue of having passed the ordeal of its schools. The part which the Philadelphia Dental College, now crowning your successful labors, has borne in the metamorphosis to which allusion has been made is creditable in the highest degree to its projectors, its alumni, and to the dental profession. Its success is without a parallel in the history of dental colleges. Its first class numbered eleven. To-day it closes its thirteenth annual session with a class numbering over one hundred, forty-four of whom have just received its degree. Every nationality on the globe where dentistry has attained a position of respectability has been represented in its classes, and its graduates are literally scattered to the ends of the earth, filling important stations in Canada, England, Scotland, Germany, France, Spain, Switzerland, Sweden, Portugal, Russia, China, Japan, Mexico, the States of South America, and the Islands of the Sea. Founded in the interests of education *for dentists*, it has kept this object as a beacon steadily in view, and since the subsidence of the first fierce waves of opposition which it encountered, the more

prominent in the profession, both in this country and in Europe, have extended its teachers the most hearty good-will. Its needs now are not greater well-wishing on the part of those who encourage higher education for dentists, but *greater well-doing*. Your duty to the profession of your choice by no means ends in the reception of these diplomas. In dissolving your relations to this institution you are assuming new ones, and more important, to dentistry.

It now has claims upon you which you should not—nay, if ye be *men*, which you *cannot*—ignore. Having received of the benefits of its schools, you should be prepared, and diligently strive to become centres of light in your respective spheres. This college, and dentistry in general, now looks to you steadily and consistently to maintain its honor. Bring not, through lack of professional integrity, reproach upon either. Both look to you to stand as frowning cliffs of adamant against the inroads of ignorance and charlatanism ; both look to you to work for the advancement of our profession in local, State and National societies ; to read and contribute to its literature ; and in whatever way opportunity may offer, to strive for the unification of dentistry and the alleviation of suffering. These obligations are now upon you ; bear them as a self-imposed burden and be to others a constant example.

A writer has said, “If you would know what space you fill in the world, thread a fine cambric needle, drop the needle by the thread into the sea, draw it out again and see the hole that is left, and that’s you.” In a certain sense that is true, for we sink into the dark waters of oblivion, and scarcely a perceptible ripple at the surface marks the time or place of our departure. In another sense it is not true, for the silent influence for good or evil which we exert will live on and on, when our very memory shall have been forgotten. A single grain of musk will perfume the air of a large room for years, and that with the air constantly changing. If then, the particles of *matter*, thus infinitesimally divided, can discover their presence to the senses, how much more shall the influence of mind upon mind be felt, while the eternal years of God roll on ! Think not to shun the responsibility of your position on the plea of no influence. It is yours to *have* influence, and to see that it is cast upon the side of right. If it cannot be like the roaring cataract, the awe-inspiring Niagara, it can be the bubbling stream, the gentle rivulet, which runs along day and night, giving comfort, joy and nourishment through all its course.

This final charge I give you : “Be strong and show yourselves men.”

Labor not for the riches and honors of this world as the aim and object of life, but labor rather for that wealth of soul which is the sure reward to him who chooses the right with invincible resolution, who resists the sorest temptations from within and without, who ministers to the sufferings and necessities of fellow man, and who relies with unfaltering steadfastness on truth, on virtue, and on God.

The valedictory address was delivered by Henry W. Morgan, M.D., D.D.S. The benediction was pronounced by Rev. D. C. Babcock, and the immense assemblage separated.

MEETING OF THE DENTAL SOCIETY OF THE FIRST JUDICIAL DISTRICT OF THE STATE OF NEW YORK.

AT THE RESIDENCE OF DR. J. B. LITTIG.

Subject for Consideration:—Methods of, and Materials for, Filling Teeth.

TUESDAY EVENING, Feb. 1, 1876.

The meeting was called to order by the President, Dr. J. S. Latimer, and the minutes of the last meeting were read by the Secretary, and approved. After the usual business of the Society the subject of the evening was announced by the President as open for discussion.

Dr. A. C. Hawes said: I like the material of tin for filling teeth better than almost anything I have ever used. It seems to keep the teeth from decaying, as the acids of the mouth have seemingly a greater affinity for the tin than the teeth. I have used it a great deal, both for temporary and permanent fillings.

Dr. Chittenden: I do not know as I ought to say that I entirely endorse Dr. Hawes' theory with regard to galvanic action. We all know that galvanic action acts most rapidly near the point of the poles. Tin is one of the greatest preservers of the teeth known. I speak a little from experience. When my wife was thirteen years old, Dr. Tripp filled her teeth with tin, and ten years ago, when connected with the Academy of Science, I proposed this material for children's teeth. Another reason is, that you can put it in position where you cannot possibly put gold. I can fill a tooth with tin foil so as to preserve the mere frame of a tooth, and children's teeth, to my mind, better than any other substance.

Dr. Wm. H. Allen : The subject is so large I hardly know where to begin or where to leave off. In my practice of filling children's teeth I have used very little tin. For teeth of a good character I use amalgam. I think anybody can fill teeth for children with amalgam better than they can with anything else, and I find that it lasts well. It can be put in with more certainty of being put in thoroughly than anything else, and I generally use it. It is cheaper for the patient, and answers the purpose, with me, perfectly. For teeth of a poor character it does not answer so well ; for such teeth I use gold.

Dr. C. E. Latimer : For most children's teeth I think the best possible filling is amalgam. I use the best article I can get, and the effect has been very favorable. The alloy is made soft first, and the excess of mercury removed by squeezing in chamois. I advise washing with soda bicarbonate. If the surface of a metal is exposed to the air it oxidizes rapidly. If you have both sides exposed it oxidizes on both sides. If the metal is filed up you have a good many surfaces exposed, on which oxide remains in the filling unless washed out. By keeping the mercury under alcohol, in suitable apparatus, there is very little oxidation.

Dr. Todd : With regard to children's teeth I would say that in my practice I have found that in most cases Hill's stopping answers a very good purpose indeed.

Dr. Atkinson : If I must say what I have to say, I think that the operator has more to do with the filling than any of the materials. I think that a good operator will be successful with almost any material that he has on hand, and when gentlemen talk about chemical results beforehand, they have too much faith for me, and when we talk about having everything ready, and about a result that we know no more about than we can deduce from our own unaided sight, I hold we ought to be careful about pronouncing anything as to the success or failure of fillings. It does not come in the art of human sharpness of insight to determine whether the filling material is in contact with the cavity or not. Any cavity that is perfectly impervious to moisture and to air around each margin, may be filled with any material not soluble in the fluids of the mouth. I have used all the substances that have been referred to to-night, and at one time I would run to one by preference, and at another time by preference to another, and standing as I have stood, I have been forced to make experiments and trials of things that I had not much confidence in, simply because I have been continually asked to give an opinion, and I wanted to have an intelligent

opinion to give. But when we speak about what is the best material for filling teeth, and the best mode in which to apply it, you must make a specific statement of what the case is. Now, I am very much in favor of oxychloride of zinc. Properly prepared, and put in just at the right time, it makes a most excellent filling, if you bring the oxychloride of zinc, in a plastic state, against the ends of the dentine, so that the cavity is kept open by the fluid. It is not proper that the oxychloride of zinc should be beaten into the cavity. If mixed with any other substance, so as to make it plastic enough to take its place around the exposed pulp and leave margin enough in the dentine, then you can put it in with perfect safety. If the margin of the tooth is imperious, the tooth is safe. It is the margin we have to look at particularly.

There seems to be a misapprehension about the law of chemical action, of which we all acknowledge most of the decayed teeth coming through our hands, as the result. There must always be a current, where chemical action takes place, going from the positive to the negative pole—or, in other words, if there be two substances, the one electro-positive and the other electro-negative, connected, a current is set up between the two. We are in the habit of saying that there is an electro-negative condition of this tooth, and we desire to have it electro-positive. Now, the two substances of gold and dentine are so exactly alike that they are almost always in balance.

When Mr. Williams will bring me a case of decolorization of pure gold that has been properly cleansed, in the mouth of a "good house-keeper," then I will consider that question. I have seen, from the same sheet, teeth filled that would turn, and the same gold, No. 5 foil, make a good filling, without any change at all. I think it is caused by carelessness on the part of the person whose teeth are filled.

Dr. Burroughs: This takes me back some 40 years from the commencement of my experience. The saying is, "History repeats itself." Humanity repeats itself, and I find that the material practice of dentistry has repeated itself. I used to be, in my earlier days, very fond of using tin as a filling, until some of the older ones began to blackguard me for using it. The principle of using the tin is right, but all depends in a great measure upon the operator, and the manner in which the operation is performed, and the conditions requiring special material to be used. The packing process, many years ago, was used with great success. Now I find that new cements have come up—e oxychloride, a comparatively new thing, and still used in a great measure, but the old-fashioned cement is nothing more or less than an

improvement on tin, and has been used to great advantage. I am in the habit of using all material, oxychloride, tin, gold, cement, or anything that comes along, if I find the peculiar condition meets the case required. I do not give any preference to any particular one, sometimes filling with tin. It is a very excellent plan which I adopted many years ago, and I still continue to use it. I cannot say as much for my friends, brothers Latimer and Allen.

In the way of amalgam, I have not had as good results, probably owing to the conditions of the case and the manipulation. I shall next hear that the introduction of arsenic and creosote, in destroying the nerve, which was very popular at one time, and has been used very extensively, and has now probably died of old age, will repeat itself.

Dr. Stockton: "The manner of filling teeth and the materials used in the operation" is a subject in which we all are very deeply interested. I simply wish to give two or three hints. In filling the approximal cavities in the bicuspid and molars, when both the anterior and posterior surfaces are decayed, my process has been to fill the anterior cavity of the posterior tooth first, and without finishing off the filling and inserting a matrix for the filling of the posterior cavity in the anterior tooth, as many do, I continue to build my gold right over into it, thus making it really one solid filling, and when done all you have to do is to separate with a fine saw, or file and finish off in the usual manner; and thus you have the original form of the teeth, and it is much the easier way to me.

Another hint: do not wash your amalgam. I had formerly taken great pains to do so, and found, notwithstanding all my care, that it shrank from the walls of the cavity. I have lately had under my observation a large number of amalgam fillings not washed, and they are excellent in every respect except in color; they have saved the teeth in which they are inserted for several years, and will continue to do so for several years to come, I have not the least doubt. Since this experience, and also the careful attention given the subject by Dr. Bogue, I have ceased to wash my amalgam, and think, from careful examination of the results, I shall continue not to wash it. Use the rubber dam, pack the amalgam with the same care as gold, and when you have finished and burnished it varnish with sandrach, and you will have good results.

In regard to the gutta-percha, it is one of the best pain obtunders to be found; insert it in the tooth and let it remain for three or four weeks, and you can generally finish the operation at that time with little or no inconvenience to your patient. It makes a good permanent filling on the labial surfaces, where there is no force of mastication upon it.

Again, in filling teeth—as Dr. Atkinson has so well just said—it all depends upon the operator. The work *must* be thoroughly done, and here is where I can ride on my hobby—the motor. With it you can do your work better and save yourself so much labor. I can stand at my chair from morning to night, day in and day out, and with its help work is a pleasure. If one does his work thoroughly, it is not so much the materials used, after all, whether it be gold, tin, amalgam or anything else. There ought to be no such thing as a poor dentist.

Dr. Miller : I am like many others. I use gold, tin, amalgam, and all the rest of the materials. In some teeth I think it is better to use amalgam, and sometimes I think it is best to use amalgam even if tin would answer the purpose as well or better, if you could get it in. The other day I was at work, and I could not get along as well putting in tin as amalgam, and so I used gold. I seldom use oxychloride in children's teeth, from the fact that I think it should be kept dry for so long a time, or else it will waste away.

Dr. F. M. Odell : One gentleman tells us how, before he had a motor, he did not cut out his cracks. Now before I had an engine of any kind, except *ingenuity*, I did cut out the cracks. It did not add much to the pocket, it is true, because other people who did not cut them out could do it three or four times as quickly as I could; but I have some little monuments standing of good work, done at a time when, I confess now, I did not know how to fill teeth.

In regard to tin. I should think I have put in a dozen fillings in the course of thirteen years; can pack gold easier and better. Where I cannot use gold I have never been ashamed to say I use amalgam. Before Dr. Bogue issued his ukase I washed it; but since then I have never done so, and I have yet to see a difference in the cases where I washed it and where I did not. I have some amalgam plugs, of which I am just as proud as if they were gold. I have done some work with Hill's stopping. I put in one plug for my wife and it stood there eight years, right in the crown of a molar tooth. Of course it did not come into much wear, you would say, but the plug remained after the tooth had decayed away from it on every side. The tooth was lost because, after this first experience in dentistry, she would never let me touch that part of her again.

Dr. Jarvis : I have been summing up my experiences during the past few months more carefully than ever before, and extending through a number of years. What is it to sum up? How can we determine what we have attained unto? One process by which I have endeavored

to accomplish this has been to save the deciduous teeth. I have a bottle containing scores of them. One collection I have contains the entire number of teeth of my two children. In doing this I have a great variety, exhibiting different stages of decay and different kinds of filling, and fillings showing different results. To explain the matter more clearly take the teeth of my own children. Some of the deciduous teeth were filled with tin. I always liked tin very well because, in the winter of 1848-9, as I was preparing the gold to fill some teeth for an old lady, says she, "What are you going to do with that?" "I am going to put it in your teeth." "No," says she, "I don't want anything of that kind in my teeth," and then she showed me two tin fillings that had been there for 32 years. Sometimes it would oxidize. More frequently it would wear away. Gutta-percha stopping has resulted about the same with me in a great majority of cases, and I have found it to rot—positively rot—exhibiting a perfectly disintegrated surface, ready to move away almost at the slightest touch. After all the pains I could take in using it, in a great majority of cases it has disappointed me.

In regard to amalgam in filling deciduous teeth, I have found it to *generally* oxidize. I find that the great difficulty is oxidation. In those that I have collected you can see a tendency in that direction. Others of these specimens I filled with gold, and I have had better results. There is a difficulty in getting it there, perhaps; but I wish to say this much in regard to gold: I can scarce conceive of a case where I cannot succeed better with gold than with anything else. I believe that gold can be used in all cases. As far as the accessibility of the cavity is concerned, we *should* make it accessible, and when we have access to the position we can do what we please with the gold. I collected quite a quantity of plugs (I do not like that word "plugs," it doesn't sound quite right, but it may be the best thing after all,) that had been used as gold fillings. I went to a society once with a lot of these fillings, for the purpose of handing them around, and I have never seen them since. I am inclined to believe that I pulled them out of my pocket and lost them, but a number of persons examined them in my office before the time to which I have referred. It was easy to see the causes of failure in these fillings. By these two methods—examining teeth and fillings—I have been able to arrive at conclusions more satisfactory to myself than looking into the patient's mouth.

I used to wash amalgam. I was told that I could not wash the black

oxide all away. That is not my experience. It grows less and less—satisfactorily. Then, the most of that is probably caused by mercury, for the mercury oxides very rapidly when exposed to the atmosphere. That wants to be washed away, and the material brought into a mass as soon as possible. I have often seen these amalgam fillings when there was no oxide upon the surface exposed.

Dr. Bogue : The idea of washing I cannot approve of for two or three reasons. In the first place, it prevents the perfect consolidation of the filling afterwards, as the water cannot be perfectly expressed. In the next place, mercury will continue to oxidize, and to yield its black oxide, just so long as it is exposed to the atmosphere. The sooner, therefore, it can be combined with the alloy of which it is henceforth to be a part, the better. It is possible to put in an amalgam filling without washing, with less mercury than is ever used when it is washed. The reasons for using little mercury are : to make a tight filling, to make a filling that will keep its color better, and most important of all, to make a filling that sets quickly, giving the mass as little time as possible to be acted upon by centripetal force, which tends to draw it together into the shape of a drop or sphere, which movement constitutes the balling or drawing up in the middle and away from the edges of the cavity so much complained of.

Dr. Francis : The material which answers the best purpose in one case, may not in another. There are a good many things to be taken into consideration. The size and shape of the cavity, and the position of the cavity. I think that in a majority of cases gold is the best material that has yet been discovered, although there are a good many cases where gold will not prevent teeth from decay.

It has been said that everything depends upon the manner in which it is filled. Certainly a good deal does depend upon how the operation is performed. Sometimes it is impossible to use gold as a filling. Just so with amalgam. I have known amalgam to not last five years. And just so with gold. So more depends upon the nature of the teeth, really, or quite as much, as the filling. I saw a filling once after it had been in a tooth for twenty years, and no decay ; but the filling projected, and had done so for a long time. I consider gold in a majority of cases the best filling, but I should hardly think of using gold in children's teeth.

Dr. Stockton : In regard to the manner of filling teeth, which has been spoken of here to-night. In filling the under surface, for instance, of the two lower molars, my process has been to fill the posterior tooth

first, and then finishing by making it really all one filling. When they were both decayed, I made my filling all into one, and went right along, and when done you can go right between them and separate the filling very quickly, and it is much easier than any other way I have found.

Dr. Odell : I would like to say a word in relation to Dr. Bogue's suggestion that tin foil rubbed upon the surface of the amalgam may be the thing to preserve the color ; I have always burnished a portion of gold or tin foils upon the surfaces of my amalgam plugs. I see some of mine which turn slightly greenish sometimes, but which if brushed with pumice will always keep bright ; I usually use gold for this purpose.

It was unanimously resolved that a vote of thanks be tendered to the gentlemen who so kindly cliniced for us to-day.

Subject for next meeting : "Manner of Inserting Fillings in the Teeth and the Principles Involved in the Operation."

Dr. Stockton consented to furnish a paper on the subject.

Next meeting at the residence of Dr. Latimer.

REPLANTATION.

By W. N. MORRISON.

On this subject it is my intention to give a brief statement of a few of the most interesting cases that have come under my care.

In thirty or forty cases, a majority have but little of interest to report. The teeth were extracted, roots and crowns filled and the teeth returned to their sockets—always attended with pain for a few minutes at first, but gradually getting more comfortable and useful. Some have been perfectly restored to usefulness in two days, and others have taken two weeks or longer.

In several instances there was a good deal of difficulty in getting suitable forceps. Special grinding and fitting were resorted to, to relieve the frail part of the crown from undue pressure. Extraction accomplished, the next thing is to keep the peridental membrane moist, and free from dirt and grit of every kind, while the tooth is being excavated and filled.

I usually wrap a piece of soft linen around the roots, then apply the rubber dam, and hold the crown in the forceps, or screw it in a vice

between two pieces of wood while working upon it. Cleanse the canals and fill with oxychloride of zinc and gold wire ; fill the cavity of decay to my satisfaction ; finishing the filling, and washing everything clean before removing the protection from the roots. Now, if the gold wire protrudes through the roots, I trim it off or rivet it down. If the foramen is not thoroughly stopped, I drill it out with a broach and drive a spud of gold wire in. I never cut a root off except to smooth a sharp point made by absorption or breaking ; on the other hand, in replanting or transplanting, if a tooth would not go to its proper position, I would burr out the process to accommodate the roots. Being sure there is no foreign substance of any kind in socket, and no loose scales of process that might be carried before the roots in replacing, I carry the tooth slowly but firmly to its place, and hold it there for a few minutes, allowing the surplus blood to escape and the serum to cement it.

Case No. 21, Miss G. C., aged 14 years ; slender build and delicate organization, V-shaped arch, with right central overlapping its fellow. By a blow from a rock in the street, one-eighth of an inch of the incisive edge, and an angular piece with its base one-eighth of an inch, and the point high up under the gum on mesial surface, were broken from the right central, both broken surfaces slanting inwardly, pulp exposed. It was the intention to fill the root and only partially restore the crown, as more extensive operations would prove too painful. And just here two other troubles arose—one was, the effort to get space between the centrals had produced too great a degree of inflammation ; and the other, about three-sixteenths of an inch of barbed broach in the root canal. So an impression was taken, and a black rubber plate was made, which would hold the crown, when restored, in a new position, correcting the irregularity. Tooth extracted, and the piece of broach found projecting through the foramen. The root was filled and crown restored and tooth replaced in socket, having been out about six hours. Patient wore the plate at first night and day, then only at meals, and finally left it out altogether.

Case No. 26, Mrs. J. C. R., aged about 25 years ; left lower first molar, large buccal cavity, which I had filled with oxychloride of zinc about two years ago, intending to fill with gold six months or a year later, or before the filling was entirely worn away. The patient failed to report in time, however, and the filling was all out and the tooth aching. After relieving all mechanical pressure, caused by decayed dentine or particles of food. I made local application, but without any

but temporary relief. The patient came three times the first day, the applications affording relief for a few hours only. Three times the second day, requesting each visit that I would take the tooth out and leave it out. On the third day, at second visit, she demanded that I should take it out. Gas was administered and tooth extracted. Patient fainted, and it was with difficulty she was restored. She went home still suffering much pain, which became so intense the family physician was called, and injected morphine into the skin ; after which she fainted three times in succession. About 8 P. M., the tooth being filled, I took it to the patient, but when I heard what she had gone through, having had no sleep for three nights previous, I concluded, after consultation with physician and husband, to let her rest until morning. When the tooth was replaced, it being done with a good deal of difficulty, owing to the spreading condition of the roots and the soreness of the parts, it could not be kept quite down in the natural position, but by occluding pressure of the jaw, it was settled nicely in its place in a few days. About three weeks after the operation, a few little scales of process came out of the gum at the buccal border, probably the result of injury during extraction. Since then the tooth has been quite comfortable and firm. There was no swelling attending this case at any time.

Case No. 28, Miss C., of Conn., aged 20, left upper first molar, pulp dead, large gold filling on corono-distal surface extending into roots ; mesial surface of second molar, a large gold filling ; mesial surface of first molar, large gold filling ; distal surface of second bicuspid, large gold filling. All these fillings in a bad condition. The first molar in particular was of dark blue color. The patient had been in feeble health for many months, and was somewhat nervous. Her older sister, whom she was visiting, objected to her having such a questionable operation performed while she was under her care. So the tooth was extracted without her knowledge, and filled in the roots, and two large crown gold fillings. Two other large gold fillings were made in the adjoining teeth in the mouth at the same time. While one operator was working on a tooth in the patient's mouth, another operator was filling a tooth for the same patient in another room. The tooth was replaced, and the patient did not tell her sister for three or four days, so you may know she either had considerable courage, or it was not very painful after the operation.

No. 31, Mrs. C. W., aged about 25 years, been married three or four years, and had two children. Light complexion and of delicate

organization. A blue pearly character of teeth, which decays very readily. About three weeks ago presented herself with right upper first molar. A gold filling on its buccal surface and a large gold filling in anterior sulcus of crown; on the distal surface a large amalgam filling, with another decay above its cervical border. Second bicuspid and second molar firm in their normal positions. I wedged the teeth apart, and was going to replace the amalgam with gold filling, put at patient's request I put oxychloride patch above the amalgam, and deferred the permanent filling until a later day, on account of sickness in her family. On her next visit she said the tooth had not been benefited by my treatment, but had annoyed her nearly all the time. She had concluded not to bother any more with it, as she did not feel equal to a two or three hours' siege of having it filled.

With the understanding, then, that if it came out whole it was to be replaced, I cut the gum thoroughly and extracted the tooth. On removing the amalgam and oxychloride fillings, we found a good protection of healthy bone, and felt that a mistake had been made in extracting. However, as the tooth was out, the root vessels must be removed and canals filled, so with a sharp burr the chamber was opened, where we found the most extensively ossified pulp we had seen for a long time, extending even into the root canals. The filling was then made—oxychloride forming the greater part—also a small filling made in the mesial surface and two fillings, one in the distal surface of the bicuspid, and the other on the mesial surface of second molar, which were easily done, the first molar being out of the way. Tooth replaced with good results; articulation perfect. There was some slight swelling on second day.

Every one will recognize with what ease and comparatively little pain this operation was performed, compared with the old way of treating such cases.

No. 32, Master A., aged 13 years; large decay on the coronal-distal surface of left upper first molar, exposing pulp. The tooth had ached for several months and he came to have it out, his parents thinking it was a deciduous tooth. It was extracted, filled and replaced in about two hours. Gave considerable pain for a few hours. On the third day there was considerable swelling in the region, which disappeared on the fourth or fifth day. The boy lost about one week from school on account of the operation, but it is now firm and useful.

In the above cases and many others I am greatly indebted to Dr. J. W. Hall for valuable assistance.—*Missouri Dental Journal*.

A MAGNIFICENT LABORATORY.

The Duke of Devonshire has presented to the Cambridge University (of which he is Chancellor) a new Physical Laboratory, which for extent and completeness is unsurpassed, and probably unequaled, by any other laboratory in the world. It is under the direction of Professor Clerk Maxwell, and though not fully fitted up is already open for students. We find a minute description of the building in *The Academy*, of which the following is a condensation:

The building is an exceedingly handsome one, constructed of a yellow freestone much used in Cambridge. In the vestibule is the lavatory, passing which, and turning to the left, we find ourselves in the unpacking room, a few feet below the level of the street and communicating with it by an inclined plane, down which heavy cases can be wheeled. At one side is a lift arranged with counterweights for raising apparatus to the museum room above. Adjoining the unpacking room is the workshop, where stands one of Whitworth's best lathes with self-acting motions, American drill-chucks, dividing plates, and many other wonderful things. The apparatus is, as well as the laboratory, the gift of the Chancellor, who, moreover, being a scientific man himself, and knowing the amount of thought required for contriving instruments, has made his gift doubly valuable by allowing two years in which to buy the standard apparatus, so that nothing need be ordered in a hurry or until elaborate experiments have been made as to the best form of each piece of apparatus.

Beyond the workshop is the battery room, which is situated under the lecture room, with which it is connected by various trap-doors, wires, pipes, etc. It contains, beside the batteries, a big receiver for oxygen gas. In the weighing and measuring room stand balances by Oertling, in which, if a piece of paper be counterpoised, a light ink mark made on it an eighth of an inch in length will turn the scale, caliper gauges by Elliot which measure to the thousandth of an inch, etc.

Now we must deposit our knives, keys and any other iron which may be about us, for we are coming to the long range of magnetic rooms where magnets curiously suspended by silk fibres are having their positions read by means of all the refinements in telescopes, scales and circles of which modern instrumental science is capable. Here all the hot-water pipes are made of copper, that their expansion and contrac-

tion may not affect the instruments. Iron bolts, however, are freely used in the ceiling, and in other places away from the apparatus, for it is only moving iron that affects the work. In the last of these rooms is a stone table, on which stands the great electro-dynamometer, the property of the British Association. There is also a stone slab, on which the horizontal force magnetometer is placed. The slab and the stone table are each bedded in deep concrete to insure steadiness.

Returning to the vestibule we go up the staircase with its beautiful carved oak balustrade, and arrive at the first floor. On the right is the lecture room, perhaps the handsomest room of its kind in England, containing seats for about 150 students. The table runs across the room, and is supported on a wall quite independently of the floor. It is excellently lighted, but if we turn a winch in the wall we see all the shutters slowly closing at once till we are left in complete darkness. Behind the lecture room and opening into it is the preparation room, where apparatus can be got ready for lecture; beyond this is the museum room, where all the apparatus not in use will be displayed in glass cases. The lift from the unpacking room below enables instruments to be placed here without the shaking which is unavoidable when heavy things are carried up a staircase. Passing through the museum we come to Professor Maxwell's private room, where stands the Thomson electrometer, to describe all the details of which would alone take a small volume. We next find ourselves in the general laboratory, a lofty room sixty feet by thirty, and containing twelve large tables. Here is the Bramah press, by means of which a pressure or strain which is indicated on the gauge as three tons per square inch can be applied. Here also are all the British Association standard units of resistance, a comparison of which with one another to see if they have varied since they were made in 1864 is now in progress. Here also are the bridge resistance coils, and galvanometers of the same kind as those by which the position of a fault, say in the Atlantic cable a thousand miles from land, can be determined within a few yards; they are, however, used for other purposes here, chiefly for the determination of the electrical constants of other instruments in absolute measure. The tables stand on blocks set in holes in the floor, and these pass through to beams which support the tables independently of the floor. There are trap-doors in the floor and ceiling in every direction, each in the ceiling being exactly over one in the floor, so that wires, say for torsion experiments, can be hung from the roof to the basement of the building.

Going upstairs to the second floor, and turning to the left, we first

come to the electrical room, where stand electrical machines and Leyden jars of all kinds. This room is to have an artificially dried atmosphere, produced by an endless band of flannel constantly revolving over two rollers, one in the room and the other kept heated by gas and placed in the chimney. A trap-door in the wall opens into the lecture room, so that wires can be carried from the electrical machines to the lecture table.

There is also here a dark room for photographic purposes. In another part of the room is a little window, so placed that a heliostat set on the ledge outside will send a beam of sunlight down the whole length of the neighboring passage. Opening from this passage are five small rooms, chiefly intended to be used as private rooms for advanced students. In one the optical bench stands; in another experiments on polarized light are conducted; in a third is the spectroscope. Going upstairs again we come to a room situated in the roof of the lecture room, from traps in the floor of which Foucault's pendulum, spheres or electrification, diagrams, etc., can be suspended. There is also another room called the mercury room, where is to be the upper end of a pipe (not yet constructed) reaching to the basement of the building for compressing gases, etc., under a column of mercury of considerable height.

On the roof above is to be a mast with a conductor for collecting atmospheric electricity.

CHEMICAL EXPERIMENTS WITH THE MAGIC LANTERN.

Of late years the magic lantern has been much used by lecturers to illustrate the curious and beautiful reactions of chemistry. We wonder that it is not regularly employed for this purpose in our high schools and academies. There are many interesting experiments that may be performed with such apparatus as the teacher in these schools generally has at hand or can make for himself with slight labor and expense.

The chief thing needed for the purpose is a transparent tank to be used as the "slide" in the lantern. This is readily made by securing two plates of glass, about four by five inches in dimension, against a strip of india-rubber half an inch thick, bent to form three sides of a rectangle. It may be notched at the corners to facilitate the bending. A few small pipettes, with solutions of some of the most common

chemicals used in a school course, are the only other things required in addition to the lantern.

The tank, three-fourths filled with water, being placed as an object in the lantern, a great variety of chemical reactions can be shown. The following experiments, condensed from English sources, will serve as examples, and the teacher will have no difficulty in adding indefinitely to the number :—

1. Pour in a little solution of sulphate of copper, and mix it well with the water of the tank ; then with the pipette run in, with more or less force, some diluted ammonia, pausing from time to time to observe the progress of the effect. On the screen will be observed the gathering of a tempest of black storm-clouds, which twirl around in violent commotion, as if urged by a tornado of wind, but as the action continues, these clouds will melt away and leave the entire field of a serene and beautiful sky-blue.

By now throwing in some diluted sulphuric acid, the same changes can be reproduced, and so on alternately for a number of times. Then, when the tank is clear, with an excess of acid, let fall a few drops of a solution of ferrocyanide of potassium from a small pipette, and rich red curdled clouds of ferrocyanide of copper will form.

2. Having rinsed the tank, or taken a fresh one with water in it as before, add to this some solution of litmus, until the whole acquires a purplish-blue tint. Now throw in very gently a little very dilute acid, and allow it to diffuse. On the screen will appear the image of a beautiful sunset sky, with its changing tints of drifting clouds.

When all has changed to red, add ammonia, and so reverse the change, which may then be repeated.

3. Proceed exactly as in the last case, but with a solution of cochineal in the place of litmus. The red color will then be changed by the acid to a brilliant yellow, and by ammonia to a rich purple.

4. Into a tank of water drop slowly a strong solution of the acid perchloride of tin. This on the screen will resemble the eruption of a submarine volcano.

When a pretty strong solution has thus been made in the tank, put in a strip of sheet zinc, and long leaf-like blades of metallic tin will at once be seen to shoot out in all directions.

5. The cohesion figures known as Tomlinson's make a very beautiful effect on the screen, one of the most pleasing being obtained as follows :—

Fill the tank with ordinary alcohol, and then drop slowly down the

side of the tank a small quantity of some aniline color. The effect is that of a tree springing from the bottom of the screen and shooting out into endless branches. If two or three colors be used, the mingling of them adds much to the effect.

6. If the tank be filled with a saturated solution of Glauber's salts, or sulphate of soda, and allowed to cool, it will appear transparent on the screen, but dropping one small crystal into it will make the whole mass shoot out into beautiful crystals.

The crystallization of many other substances, such as bichromate of potash, alum, etc., and the precipitation of iodides of silver, mercury, and other salts, also form beautiful objects on the screen.

[*Boston Journal of Chemistry.*

DOWN CELLAR.

Man, at least in his present stage of progress, can hardly be considered a burrowing animal, and the more he lives above ground the better, doubtless, for his health. He cannot live always out-of-doors, perhaps, and in building his domicile his first care should be to have it high and dry. To do this necessitates first the judicious choice of a site, and next the proper use of it. The man who "founded his house upon the sand" doubtless dug a cellar, and depended on it to his cost, while he who "built upon a rock" had a high, airy basement, and lived happily.

The old-fashioned, deep, dark cellar, with its steep stairs, its slimy walls, and its annual spring freshets, always seem a fitting place for foul, dark deeds, and a good nursery for potato sprouts, fungi, and germs of typhoid fever. The rickety, thin-walled, breezy, out-of-ground basement of the modern "built-to-sell house" is better, but a proper medium between the two is better still.

A cellar which finishes eight feet and a half in the clear is high enough for an ordinary house, and for this height put the floor four feet below the original surface of the ground, and bank or grade the walls two feet higher outside. This will leave two feet and a half of wall to show as underpinning. The walls should be started from broad flat footings of stone, or projecting courses of brick, or concrete of cement and gravel. They should rest on firm and solid ground, at least six inches below the cellar floor, and always below the deepest frost (reckoning from the level of new grade outside). The frost last winter penetrated to five feet in depth in exposed situations, and many foundations ordina-

rily considered safe were disturbed by it. An even, dry, gravel soil is the best, both for a foundation and for health. Clay soils are treacherous and have a deservedly bad reputation.

If ledge stones are available they may be used to advantage, but they should be of good sizes with flat surfaces, and should be laid with snug joints, well bonded and tied together, and most of the stone should go clear through the thickness of the wall. The whole work should be laid and pointed with cement and lime mortar mixed together in equal proportions. Walls in very dry situations may be laid without mortar, the joints being pointed or filled with mortar after the stone is laid. Very durable cellar walls may be built of good hard-burned brick, laid in cement or cement and mortar. They should have footings of flat stones or of brick-work, and should be built vaulted, that is, with an air space between the outer and inner courses. For an ordinary wooden house a wall should be made up of two courses solid (about eight inches) outside, an air space of two inches, and an inside wall of one course (or four inches); the inner and outer walls being connected and tied together across the air space at frequent intervals by brick headers. This kind of wall has many advantages, as it keeps a cellar warm in winter, and is not easily penetrated by water. Where stone is used below ground, the vaulted brick wall makes an excellent "underpinning" above ground.

If a house is located on a wet soil, special means must be employed to keep the cellar dry. A trench dug around the outside, as low as the footings, filled with loose stone, and extended by a pipe drain to lower ground, will in many cases prove effective. Or a trench may be dug around the cellar inside and filled in the same way, with an outlet under the wall at its lowest corner, for the water to run off. These are called "blind drains," and are built of various sizes, according to circumstances, but should scarcely ever be less than a foot by eighteen inches in section. These channels are simply to carry off water from the ground, and keep the floor and walls dry, and of course are never to be used for any other purpose. If the floor of a cellar is unusually wet and spongy, it may be necessary to cover its whole surface with coarse gravel or broken stone, or other dry, porous rubbish through which water may pass freely, and to make frequent outlets under the walls with drain pipe, which should be connected with proper drains outside.

Whatever the nature of the ground in which a cellar is dug, the whole floor should be made proof against the passage of dampness. This may be done by covering it with concrete three inches or more in thickness. The concrete should be made of cement and clean gravel,

mixed in the proportion of one of the former to five of the latter, and the whole be well smoothed over with cement and sand. Or some of the asphaltum or coal tar concretes may be used, though these are more or less objectionable on account of their disagreeable odor. Brick laid and "grouted" (washed over) with cement mortar makes a good but more expensive floor. Previous to any covering being put down, the earth should be well leveled and rammed to furnish a solid bed for the concrete or paving.

A cellar should be well lighted in every part by windows, and besides the natural ventilation which can be had by opening these occasionally, there should be if possible one or more openings into warm flues in the chimney stack, so that the air may be continually changing.

No regular drains for sewage should ever be laid under a cellar floor. No matter what precautions are taken, there is always a chance that some leakage may sooner or later occur, and when it happens it may go on for a long time, filling the earth with offensive and unhealthy deposits, until the inmates of the house are seriously affected. Drains are put out of sight, and frequently their location is forgotten. In changes which often take place, some of them may be abandoned or partially closed. These old drains furnish harborage for rats, and various kinds of decomposing matter are collected in them. In time the cellar floor may crack or settle, and putrid gases rise into the house. Thus what should be a clean and healthy foundation for the whole structure becomes a dangerous nuisance. There is but one simple and effective remedy, and that is to start the drain pipes at the outer wall, and hang all the waste pipes from the cellar ceiling in plain sight and where the slightest leakage can be at once detected. These pipes had best be of iron, and in any ordinary building can be arranged to have a sufficient pitch towards the drain without coming below the cellar ceiling enough to interfere with headway, and at the wall can be carried down perpendicularly into the mouth of the drain pipe, where the junction should be made tight with cement, and should be in plain sight. The best kind of drain pipes are of "glazed stone wear" with socket joints, and they should be laid in a bed of cement, and the joints made tight with the same. For common drains a pitch or fall of one-half inch in a foot is sufficient.

If every man who builds would remember that everything which commonly goes under the name of sewage is dangerous to the health of his household, and should be removed as quickly and to as great a distance from his home as circumstances will permit, he will, of course, so build as to render this removal prompt and effectual.

[*Boston Journal of Chemistry.*

ON METHODS OF SOOTHING PAIN PRODUCED BY DENTAL CARIES.

From Monthly Review of Dental Surgery.

PARIS, 7th Nov., 1875.

MR. EDITOR: You published in your number for the 30th of October last a short note by Dr. Lardier, relative to the employment of collodion for soothing pain produced by dental caries. In that note our honorable *confrère* told us that having tested the insufficiency of different means proposed—those which I have formulated, as well as others—he had recourse to this agent, which has procured him great success in many cases.

I am far from calling in question these facts. Indeed, collodion has long been used, and it may be suitable in certain circumstances. These circumstances are always so special that, on the other hand, I can state cases where the application of collodion to dental caries has been really fatal. In one of these, quite recently, a single dressing of collodion provoked an explosion of violent character, followed by phlegmon of the face and a rather extended necrosis of the upper jaw. Surely, if Dr. Lardier had met with a case of this nature, his confidence in collodion would be much shaken.

In fact, the choice and application of therapeutic means depends essentially, as is well known, on the exact knowledge of the case to which they may be applied. Dental caries has various forms, diverse symptoms, and a remedy which may suit one form of the disease is absolutely wrong for another. Any medicaments recommended for the alleviation of pain in caries, those that I have indicated, as well as others, as collodion—any of these ought not to be considered applicable and useful in general. It is with regret that I have sometimes found in certain medical publications one of my formulas reproduced under the title, “Treatment for Dental Caries.” A therapeutic mixture no more constitutes the treatment of caries than a blister represents that of pneumonia; this treatment is for such a form or such a symptom of a certain affection, and not for a morbid entity. These are truly common failures in modern therapeutics.

If Dr. Lardier had taken the trouble to make known at what period of the disease and against what kind of pain he had employed collodion with success, he would have rendered a certain service to practitioners, who often meet with accidents of this kind. This determination would be easy, even *à posteriori*; but we would adhere to generalities, and re-

mark, above all, that the therapeutic indications of dental caries are numerous and distinct, against the element of pain opiates and anæsthetics are occasionally employed. In certain cases occlusion alone brings temporary calm, and it is in this condition, we think, that colloidion is useful, consequently, in the course of the second period, and at the commencement of the third, dangerous. If there is inflammation therapeutics again vary. In case of denudation of the pulp, we must have recourse to astringents and caustics. Complications of caries are themselves very numerous, and require appropriate treatment.

What we can, nevertheless, affirm is, that in almost all cases the relief from pain in caries may be rapidly obtained; that the radical and complete cure of the patient is possible, but that would be according to the therapeutic means established, on the diagnosis differing according to the varieties, periods and complications of the lesion.

The question, as may be seen, is sufficiently complex, and cannot be treated of within the limits of a letter. The remarks that we have made have for their end only a warning to practitioners against the danger of falling, with respect to dental caries, into a blind empiricism in according a constant therapeutic action to a means which should be used for a particular case, to a certain symptom, and not, that is to say, in a multiple pathological state.

Believe me to be, &c.,

L'Union Médicale.

DR. E. MAGITOT.

ALVEOLAR ABSCESS.

By MORDAUNT STEPHENS, M.R.C.S., L.D.S., M.D., D.D.S., Paris.

If I am not mistaken, we are all searching together for a rapid and easy method of curing alveolar abscesses; it takes so long to open up and disinfect pulp cavities, cure the abscess, and replace the extracted nerve by carefully filling the roots to their very apices, that, for the sake of our patients, to say nothing of ourselves, we ought to endeavor by patient experimentation to arrive at such a desirable result. As far as I can see, we are no nearer the mark than we were ten years ago. We have tried creosote, carbolic acid, tannin, oxy. chl. of zinc, salicylic acid, &c., and succeeded with all these agents, but only after careful and laborious manipulations. I notice that some gentlemen have found a solution of the problem; they cannot unravel the Gordian knot, so they propose the Alexandrian method. "We cannot cure alveolar abscesses, *rapidly*, so we will . . . let them go on running." A vent-hole

is carefully drilled for the purpose, and the gases and other putrescent animal matter allowed to escape in the mouth. The tooth no longer troubles the patient, but his friends carefully avoid his vicinity, and no wonder. I would, so far as I am concerned, a hundred times rather have the tooth out than allow this ancient operation to be revived for my sake, turning my mouth into a common sewer. The plan proposed by Mr. Coleman may also be objected to. This gentleman proposes putting arsenious acid into the pulp cavity and filling immediately; but to cure an alveolar abscess so rapidly we must not only disinfect the putrescent material, but *we must occlude the terminal opening of the roots*. Arsenious acid does not do this, nor does any other antiseptic used merely as an antiseptic. I must confess, although I find it very easy to criticise, that if called upon to suggest a rapid *and easy* cure for alveolar abscesses I could not propose one, although I have studied this subject with special attention, and made numerous careful experiments to accomplish this object.

When a fistulous opening exists on the gum we can (particularly when we have to treat a single-rooted tooth) apply the dam, remove the dead nerve, soak the nerve cavity for half an hour with carbolic acid or some other antiseptic, fill the root with gold wire, and the cavity of decay with non-adhesive foil, all in one sitting; but when no fistulous opening exists I confess I cannot cure an abscess under five sittings (as I do not like perforating the alveolus through the gum); and, for the sake of veracity, I must add that not only have I not found a rapid method of treatment for these affections, but I am equally distant from having found an *easy* one. What we require is a preparation which, being injected in its liquid state into the pulp cavity, will disinfect whatever *débris* of the dead nerve we have not been able to remove, and being drawn by capillary attraction up the nerve cavities will there solidify. I have tried for months, nay, years, to find this preparation, and have signally failed.

Oxychloride of zinc, however liquid, will not do this, nor will it when mixed with creosote, carbolic acid, salicylic acid, or chloride of lime. I have tried everything that could be thought of without success.

We have to enlarge the nerve cavities, clean them thoroughly, and carry the filling up to the end of the root to-day as we did five years and ten years ago.

All hail to the man who will find a rapid and easy cure for alveolar abscess, but alas! as the song says, "It has not happened yet."

[*Monthly Review of Dental Surgery.*

NOTES.

Ohio Dental College Commencement.

The thirtieth annual commencement of the Ohio Dental College, on College street, took place last night in the presence of the Faculty, members of the Board of Trustees and the Mississippi Valley Dental Association, now in annual session in this city.

The occasion was graced by the presence of many ladies. The exercises were opened with prayer and reading the Scriptures by Rev. Jos. Chester.

Dr. J. Taft, Dean of the Faculty, then presented the following young gentlemen to the President of the Board of Trustees as candidates for graduation :

NAME AND SUBJECT OF THESIS.

J. R. Bell, of Ohio—Treatment of Exposed Pulp.

E. G. Betty, of Ohio—Opium.

A. T. Good, of Ohio—Dentistry, and Its Relation to Other Sciences.

N. S. Hoff, of Ohio—Development and Eruption of Deciduous Teeth.

W. R. Hale, of Ohio—Causes of Decay.

C. I. Keeley, of Ohio—Filling Teeth.

W. D. Kempton, M.D., of Ohio—Inflammation.

E. W. Poole, of Ohio—Fifth Nerve.

C. F. Porter, of Ohio—Digestion.

A. Taft, of Ohio—Continuous Gum Dentures.

J. B. Kidd, of Kentucky—Effects of First Dentition.

C. E. Canine, M.D., of Kentucky—Nitrous Oxide.

E. H. Lathrop, of California—Anæsthesia.

J. S. Clements, of Wisconsin—Deposits on the Teeth.

J. G. Reid, of Indiana—Diseases Caused by Decayed Teeth.

T. C. Kern, of Nebraska—Deterioration of Teeth.

Dr. James Taylor formally received the candidates and conferred the degree of Doctor of Dental Surgery upon each. He also, on behalf of the College, presented each with a handsome copy of the Holy Bible, in conformity with the custom of the institution, with the expressed hope that they would make it their rule and guide through life.

After conferring the degree Professor James Taylor, President of the Board of Trustees, delivered the address to the graduates, and congratulated them upon the successful termination of their studies, and their entry upon professional life ; reminded them that it is Centennial year, and that a review of the profession of dentistry was perhaps in order.

Whitwater, Wis., Mar. 10th, 1876.

Mr. C. M. Wright, of Basel, Switzerland, in the Jan. No. of JOHNSTONS' DENTAL MISCELLANY, prays that the coming dentist may appear with a filling that will endure in white chalky teeth. He thinks that gutta-percha and oxychloride of zinc fillings will protect such teeth while the fillings last, but that they soon wear out, requiring frequent refilling ; and that amalgam, though it wears well, soon fails around the border, from decay appearing in that locality.

A cheap, reliable filling is no doubt a de-

sideratum, and honor, if not riches, awaits the finder ; but while it is not yet found, in time it *may be*, and we can all hope and *work* for the good time coming.

I have experimented a little with the view of finding an inexpensive filling that will endure in all kinds of teeth, and perhaps my experiments may interest some of the readers of the DENTAL MISCELLANY. I had noticed that amalgam *wore* well, and that gutta-percha and oxychloride of zinc *protected* the teeth well while the fillings lasted. Now here are two properties which *together* are what we desire in a filling. The amalgam possesses resisting power, and the oxychloride the protecting power, and the thought came to me, why cannot both qualities be secured by uniting the two materials? and I have filled a number of teeth on this plan. This is the way I did it :

I mixed a sufficient quantity of amalgam in a wedgwood mortar, grinding it fine, and removing the excess of mercury by squeezing in buckskin with pliers, returned to mortar and added a little more in bulk of ox. chlo. powder (I used Gullois' cement) than there was amalgam, ground the amalgam and oxychloride finely together and emptied on glass slide. After drying cavity, dropped enough of the chloride solution on to mixture to wet it, mixing gently with fine spatula ; removed excess of moisture with napkin and filled cavity, keeping filling dry until oxychloride hardens sufficiently to dress, fill into shape, when coat with gutta-percha dissolved in chloroform.

My theory is this : that the oxychloride sets so much quicker than the amalgam that it prevents the amalgam contracting and drawing the filling away from the walls when it sets, which I take to be the principal reason of the failure of most amalgam fillings. The amalgam serves to give the filling hardness and resisting power. I have experimented in this manner for about three months, and so far the

fillings I have put in look well, but it is of course not a sufficient time to fully test the method. I hope other dentists will experiment in this way of filling teeth and publish the result of their experiments.

Respectfully,
JAMES PARSONS, D.D.S.

The Connecticut Valley Dental Society will hold its next semi-annual session at Hartford, Conn, on the 13th and 14th of June. Prominent members of the profession from other societies are expected to be present, and a large and interesting convention is confidently expected. The Executive Committee will issue programme in a few days.

C. T. STOCKWELL, *Sec'y.*
Springfield, Mass.

The eighth annual meeting of the Georgia State Dental Society will commence on the 9th of May, 1876, in the City of Atlanta, Ga.

The annual meeting of the "Kansas State Dental Association" will be held at Atchison, Kas, commencing on Tuesday, the 2nd day of May, 1876.

The profession is cordially invited.

J. D. PATTERSON, *Secretary.*

Copying Ink Requiring no Press.

Take one ounce of coarsely broken extract of logwood, and one drachm of crystallized carbonate of soda ; heat in a porcelain vessel with eight ounces of distilled water, until the solution is of a deep red color. Then remove from the fire and stir in one ounce of glycerine, fifteen grains of neutral chromate of potash dissolved in a little water, and a mucilaginous solution of two drachms of finely pulverized gum-arabic. This ink keeps well, and does not attack steel pens. The impression is taken on thin, moistened copying-paper, at the back of which is placed a sheet of writing-paper.

CROWDED OUT.

Our advertising space is so limited that there are many articles of which we wish to remind our customers, but are unable to find room for extended notices of them. We mention some of these articles below, referring for a more detailed description to previous numbers of the MISCELLANY, and to our Catalogue of Instruments, which is sent free on application.

1. Instruments for Dental Engines. See Catalogue of Instruments, also MISCELLANY for Feb. and March, 1876, and Nov., 1875.

2. Remodeled Morrison Dental Engine. A few left at \$30.00; with right angle, \$35.00; boxing, \$2.00.

3. Elliott's Saliva Ejector. \$5.00. See Jan. and March MISCELLANY.

4. Nickel-plated Cuspador with Gold Trap. See Jan. MISCELLANY.

5. Osborn's Reflectors. \$5.50 per set. See Jan. MISCELLANY.

6. Premium Gutta Percha. \$5.00 per ounce. See March MISCELLANY.

7. Bronson's Gutta Percha Instruments. See March MISCELLANY.

8. Diamond Amalgam. \$3.80 and \$4.00 per oz. See January MISCELLANY.

9. Examination Tablets. 50 cts. per pack of 100.

10. Cloth Covers for DENTAL MISCELLANY, ready for Binder. 30 cts. each.

11. Five Dental Pictures for Portfolio or Framing. 50 cts. each.

12. Plate of Fifth Pair of Nerves—Colored. \$1.00.

13. Artery and Tape Forceps, Plated. \$2.75.

14. Foil Carrier and Plugger combined—Plain, \$2.00; Plated, \$2.50.

15. Sickle Scalers. Set of four, \$2.00.

16. Separating Files. Nos. 00 to 0, per doz. \$1.50.

“ “ Nos. 1 to 6, per doz. \$1.00.

17. Walrus Hide Wheels and Cones. From 25 to 50 cts. each.

18. Felt Wheels and Cones. Two sizes of each, 20 and 40 cts. each.

19. Fitch's Instrument Stand. For Excavators, Burs, Pluggers, &c. For 3-16 inch handles, and for 3-8 inch handles, each \$1.50. See January MISCELLANY.

20. Engine Instrument Stands. From \$1.00 to \$2.00 each.

21. Stoned Burs, for Morrison-Suspension, for White Engines. See Catalogue of Instruments.

22. Minim. or very small Burs. See Catalogue of Instruments.

These, as well as all other dental goods, are constantly in stock and for sale by us.

DENTAL ENGINES.

THE TIDE HAS TURNED !

We have had a longer experience in the manufacture and sale of Dental Engines than any other house, and have been greatly surprised at the popular preference for an engine that we had rejected after careful examination as having grave faults inherent in its plan. So strong has been the current against us that we had almost doubted the correctness of our conclusions ; but at last we find them vindicated, and the profession fast reaching the truth that to do satisfactory work an engine must be completely under control, and the instrument make a steady, and not a chattering cut. We are daily importuned to substitute our Suspension Engine for those of other makers. We append a few recommendations, recently received, of the Suspension Engine.

JOHNSTON BROS.

Augusta, Ga., March 14th, 1876.

SIRS : Your Suspension Engine I regard as perfect in every detail. It works with equal facility in any position. Work impracticable to do by hand can be done with this engine with ease and comfort to the patient. It is entirely out of the way of the patient and operator, and I can work it myself easier and do more work than I could with the Morrison engine with a man to drive it for me.

Yours truly,

E. W. HARKER.

MESSRS. JOHNSTON BROS.

New Haven, Conn., Feb. 19th, 1876.

DEAR SIR : In reply to your letter, I would say I have used the "Suspension Engine" for over a year and like it very much. I think it is superior to any other for carrying the corundum disk.

Yours very truly,

H. S. BASCOM.

MESSRS. JOHNSTON BROS.

New York, Feb., 1876.

DEAR SIR : I have been using your Suspension Dental Engine for many months, and I am free to say that I consider it superior to any engine I ever saw. It is neat, simple and durable in its construction, and nearer perfection in its operations than any engine now in use.

Yours truly,

WM. C. BENNETT.

JOHNSTON BROS.

Augusta, Ga., Feb. 17th, 1876.

DEAR SIR : The Suspension Engine I believe to be superior to all others. I am delighted with the one I purchased a year ago. It presents numerous advantages, notably, its extensive and easy range of motion, and its convenience

of application. When properly placed, it is never in the way, requires no moving into or out of position, and is always ready to hand for immediate use. If suspended two inches to the left and four to the rear of the patient and propelled by the left foot, there are no cords to incommode patient or operator, no arms or cables to interfere with bracket or cabinet, and no hand-piece to be painfully reached for or carefully laid aside. There is the hand-piece just above the patient's head, easily reached, and with no danger that in being taken hold of or released, the tool will fall out or the disk be broken by striking against chair or standard. The range of motion is greater than necessity demands. I do not hesitate to say that first-class dentistry can only be done with the aid of an engine, and best, I believe, with the Elliott Suspension Engine.

Very respectfully, etc.,

WM. C. WARDLAW.

JOHNSTON BROS.:

557 Orange St., Newark, N. J., Feb. 16th, 1876.

Yours at hand: In answer would say that the Elliott Suspension Engine is a great improvement on, and has many advantages over any engine in the market at present. The one virtue of using the hand-piece at any angle is to my mind the greatest advantage secured by this little help to the dentist. The hand-piece, too, is just the thing; I used one of another make the other day, but did not think it nearly as good. As to its general utility, it certainly is my choice of them all, and I would not be without one for three times the amount it cost.

Yours, etc.,

J. C. HANK.

JOHNSTON BROS.

Feb. 16th, 1876.

GENTLEMEN: After having used your Suspension Engine a year, I have no hesitation in stating that it has *all* the advantages you claim for it. Among the most prominent are, first, its perfectly free movement, second, the lightness with which it runs, and third, its durability.

Yours, etc.,

ROBT. B. CANTRELL.

P. S.—This engine *costs less to run* than any other I have ever had. In fact, it can be run full power *a whole day* on two glasses of lager.

Wilkesbarre, Pa., Feb. 25th, 1876.

The Elliott Suspension Engine, which I have been using the past year, has worked satisfactorily to me in every way. I find in it a combination of all requisite power with a perfect range of movement; and these qualities, added to the facility with which the hand-piece is thrown out of the way and so readily reached, render it, in my opinion, all that can be desired.

W. C. STARBUCK, D.D.S.

MESSRS. JOHNSTON BROS.:

Manchester, Mich., March 13th, 1876.

I have now been using the Suspension Engine two years, after having used the Morrison over two years. I much prefer the former to the latter. The suspension just fills the bill. It is always in running order, and does its work well and quickly, is always in reach and at the same time out of the way. It is light in the hand, is easily controlled, cuts when and where the operator directs without cutting away too much "tooth substance," as some fear is too often done with engines (that is, if the operator has intelligence and skill enough to be competent to perform his operation well, if his head does not *whirl*.) I would not dispense with it for much more than cost. I believe the operator's skill can be made to operate through so perfectly an adapted machine as well as through the hand, in directing any lesser instrument, and more satisfactory.

Very truly yours,

E. HUNTER.

MESSRS. JOHNSTON BROS.

Newburgh, Feb. 17th, 1876.

GENTLEMEN : I would like to say something about the Suspension Engine, invented by my friend Dr. W. S. Elliott of Goshen. I have used it one year, and to me its great features are smoothness of motion, universality of application, so easily taking its flight upward when no longer needed, and so reachably and unresistingly coming down when called again into action, performing all its duties with such quietness of deportment that it readily becomes a favorite with patients as well as operators. I have ceased to look for anything better in any engine.

Very truly yours,

L. S. STRAW.

MESSRS. JOHNSTON BROS.

Bridgeport, Feb. 26th, 1876.

GENTLEMEN : I have had your Suspension Engine in constant use for the past nine months, and in reply to your inquiry desire to say that it has given perfect satisfaction; and in the freedom of motion and steadiness of the hand-piece is superior to any I have used or seen.

Yours respectfully,

W. L. FERRIS, D.D.S.

MESSRS. JOHNSTON BROS.

Oneonta, Feb. 24th, 1876.

GENTLEMEN : It gives me pleasure to say a word in commendation of your Suspension Engine. I have used the Morrison, the original Suspension (as made by Elliott), and am now using S. S. White's Engine with latest improvements, and can say with all sincerity I think your Suspension Engine the best Engine now in use. It has ample strength, works very easily and is entirely noiseless, the last named quality being very desirable, as the noise of all engines (except the Suspension) is very aggravating to both patient and operator. I am with great respect, yours truly,

L. E. IRELAND

MESSRS. JOHNSTON BROS. :

Hagerstown, Md., March 7th, 1876.

The Suspension Engine, now in use one and a half years, daily gives me entire satisfaction, its adaptability is a quality worthy of notice, especially for the patients. Have owned and used two others, much prefer the Suspension.

Respectfully,

J. E. SWALLOW.

MESSRS. JOHNSTON BROS.

Peoria, Illinois.

GENTLEMEN : After over one year of constant use of the Suspension Dental Engine, I can say with confidence that I believe it to be the most complete engine for dental purposes yet offered to the profession. Much superior to any other in its adaptability to all pains; the steadiness of motion it maintains in all possible positions, the ease and freedom with which the operator can run it from morning till night, can not be equaled by any other. I can stand in front of my patient, which I find a very great advantage, as I can get close to my work, which you cannot do with every engine as the arm prevents. With the constant use my engine has had, the wear is scarcely perceptible.

Yours very respectfully,

W. T. SMITH.

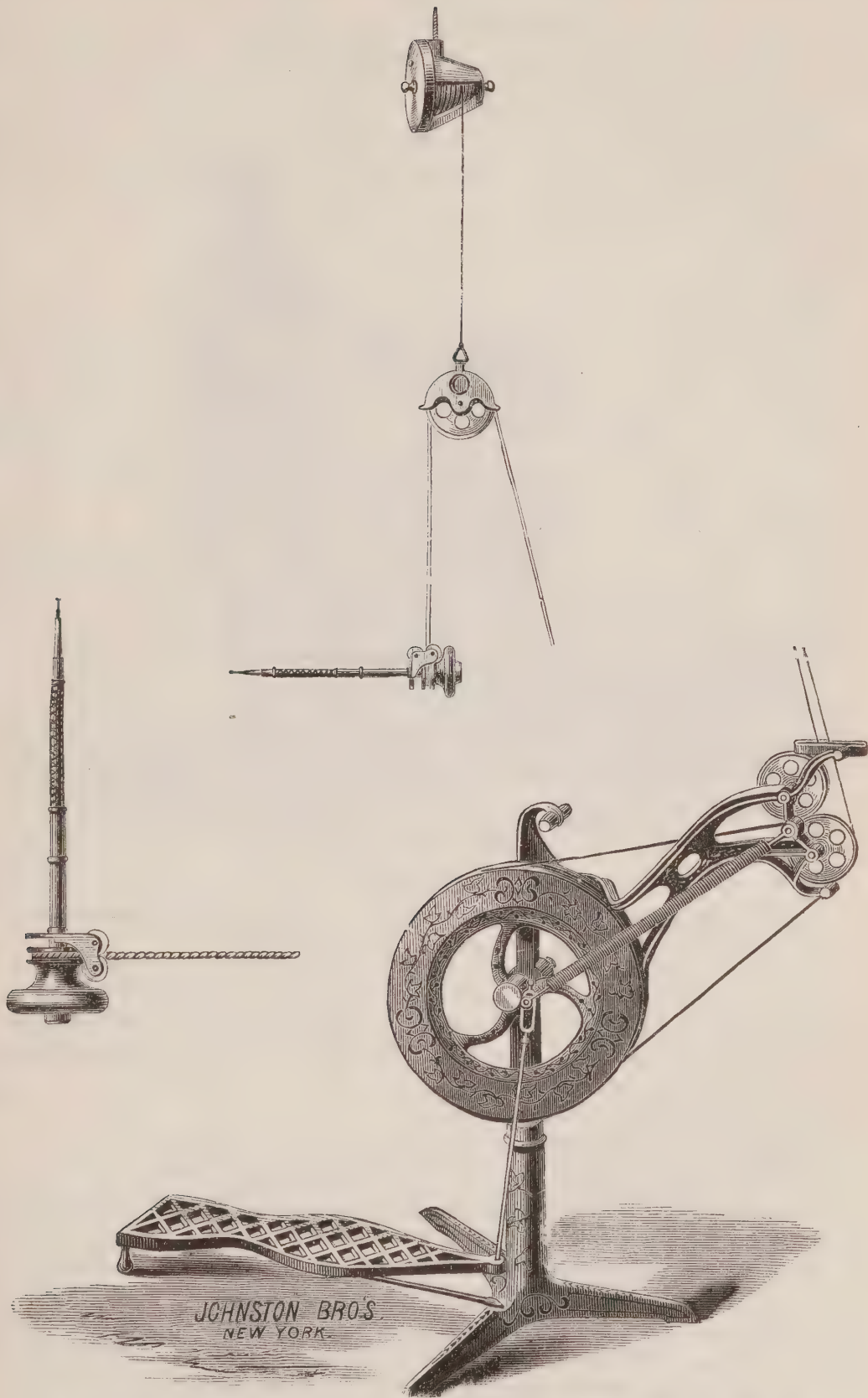
MESSRS. JOHNSTON BROS.

Macon, Ga., Feb. 24th, 1876.

We cheerfully state that your Suspension, after a good fair trial, was found to be quite the thing; noiseless, out of the way when not being used, and when used quite convenient, effective. To appreciate it and its value one must have it and know how to use it, which is easily learned. We saw one in constant use in Atlanta in the office of Drs. Billipp & Smith. They were very much pleased with it and found no faults in its arrangements or service. We have two engines on hand or would have purchased one of your engines.

Very respectfully,

B. P. & W. R. HOLMES.



SUSPENSION DENTAL ENGINE.

(DR. ELLIOTT'S INVENTION.)

Price, \$50.00. Right Angle Attachment, \$5.00. Boxing, \$1.00.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or "chattering" which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a "*light running*" Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROTHERS, 812 Broadway, N. Y.

THE MORRISON DENTAL CHAIR.



**Price \$150.00, or, with Castors, \$160.00. Boxing, \$5.00.
Spittoon Attachment, \$8.00.
WITH JOHNSTON'S NEW HEAD-REST, \$8.00 EXTRA.**

It possesses great superiority over any chair before offered to the profession, and is at the same time less expensive than any other first-class chair. Some of its points of superiority we here enumerate :

- 1st. All the advantages of any low-based chair, and also of any high-based chair, are here secured in a single chair. In it the patient can be placed lower than in the lowest-based chair made, or higher than in any other of which we have knowledge. At its lowest position the seat is fifteen inches, and at its highest position forty-two inches above the floor.
- 2d. The operator using the Morrison Chair can either stand or sit at his work, as he may choose, working with equal convenience in either position.
- 3d. It has been a very general complaint that dental chairs are too wide at the back, so holding the operator away from his work. Here this difficulty is overcome. The chair is narrow at the back, so that the operator need not stretch to reach the patient, but *can lower either arm of the chair out of the way* and so be as near the patient as he may choose.
- 4th. It can be changed from its lowest to its highest position in seven seconds - a celerity impossible in any chair raised by a screw.

5th. It can be very readily and perfectly adapted to operations on children of any age

First. Because in it the child can be raised as high as needed for the tallest operator.

Second. It provides a comfortable back and head rest, exactly as for grown persons.

Third. The footstool can be lengthened or shortened, to suit children of any size.

6th. The back of the chair can be lengthened or shortened rapidly and at will.

7th. The lower part of the back can be thrown forward to support the small of the patient's back.

8th. The chair, when adjusted to any position, is firm or steady wherever placed, and this is *especially true of the head-rest*.

9th. It occupies less room than any other operating chair.

10th. Although the footstool, when at its extreme length, is much longer than any other made, yet a person of ordinary weight can stand on its extremity without tipping the chair.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

We venture to append the names of some of those who have used the Morrison Chair. As the list of purchasers is too long for publication here, we name a few only from each section of the country.

O. A. JARVIS, *New York.*

D. H. GOODWILLIE, *New York.*

O. A. HOUGHTON, *Brooklyn, N. Y.*

A. C. HAWES, *New York.*

W. B. CHAMBERS, *Newark, O.*

C. B. ANSART, *Oil City, Pa.*

M. H. WEBB, *Lancaster, Pa.*

T. W. FRENCH, *Gt. Barrington, Mass.*

E. H. EVANS, *Rockland, Me.*

E. O. SMITH, *Salem, Oregon.*

W. F. LEWIS, *Winona, Minn.*

T. J. McMILLAIN, *Paris, Ky.*

G. W. TINDALL, *Kansas City, Mo.*

A. W. KINGSLEY, *Elizabeth, N. J.*

J. N. SCRANTON, *Bennington, Vt.*

O. A. GLIDDEN, *New York.*

JAMES MCMANUS, *Hartford, Conn.*

R. F. BORDEN, *Red Bank, N. J.*

F. A. SHAILER, *Essex, Conn.*

WILLIAM DUTCH, *San Francisco, Cal.*

R. B. DONALDSON, *Washington, D. C.*

B. F. COY, *Baltimore, Md.*

C. P. CLIFFORD, *Lowell, Mass.*

S. H. HINKEL, *Stannton, Va.*

E. G. WHEELER, *Mobile, Ala.*

J. A. DAVIS, *Chicago, Ill.*

C. B. ERICHSON, *New Britain, Conn.*

H. BENTLEY, *West Meriden, Conn.*

H. H. SAYLES, *Elmira, N. Y.*

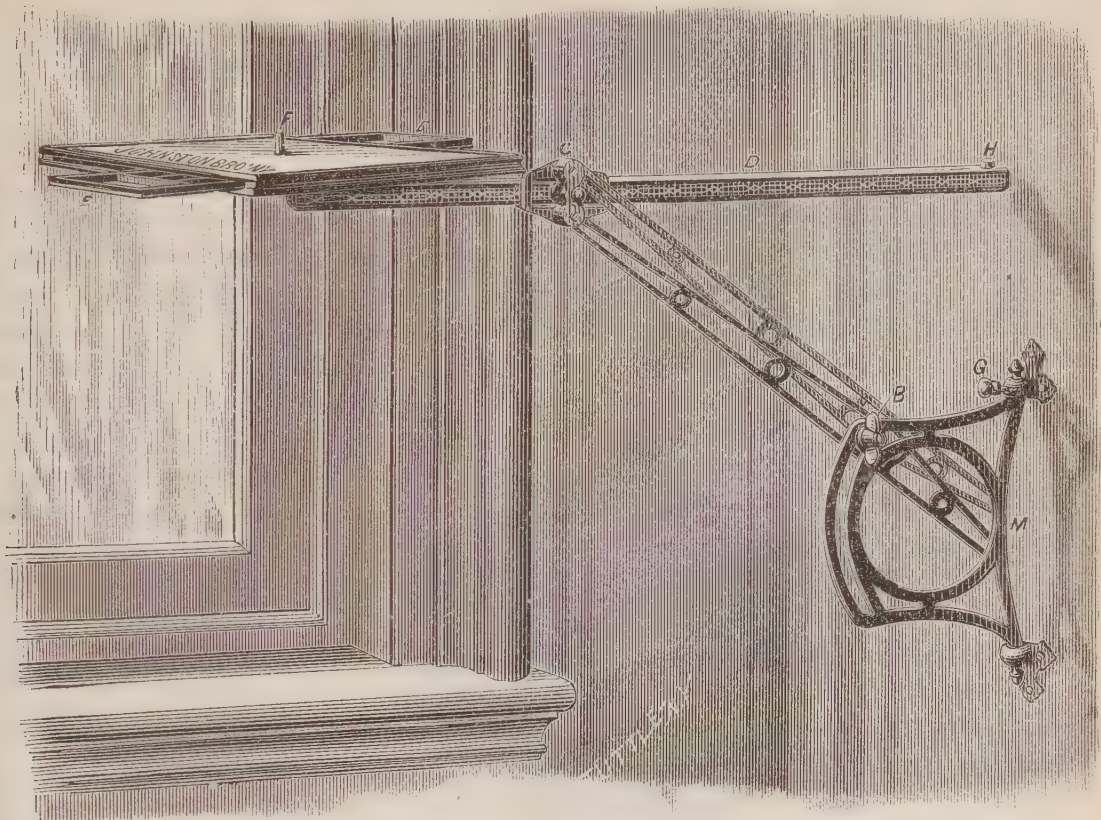
PRESTON DAY, *Warren, R. I.*

E. T. DARBY, *Philadelphia, Pa.*

G. W. TRIPP, *Auburn, N. Y.*

H. B. SANDS, M.D., Surgeon, *New York*

MORRISON DENTAL BRACKET



PRICES.

With Black Walnut Table, 12 inches square.....	\$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather.....	40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket.....	17.00.
Boxing.....	\$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

- 1st. It combines a greater variety of range and movement than any other.
- 2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
- 3d. It provides a clean receptacle for foil and instruments.
- 4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
- 5th. Its drawers extend through the table and can be opened from either side.
- 6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($\text{NO}^2 + 2\text{O} = \text{NO}^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid Nitrous Oxide*, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether	I	death to 23,204 administrations.	
Chloroform	I	" 2,723	"
Mixed Chloroform and Ether	I	" 5,588	"
Bi-chloride of Methylene	I	" 7,000	"
NITROUS OXIDE		no Deaths in 75,000	"

Edward R. Squibb, M.D., than whom our country has no more able pharmacist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

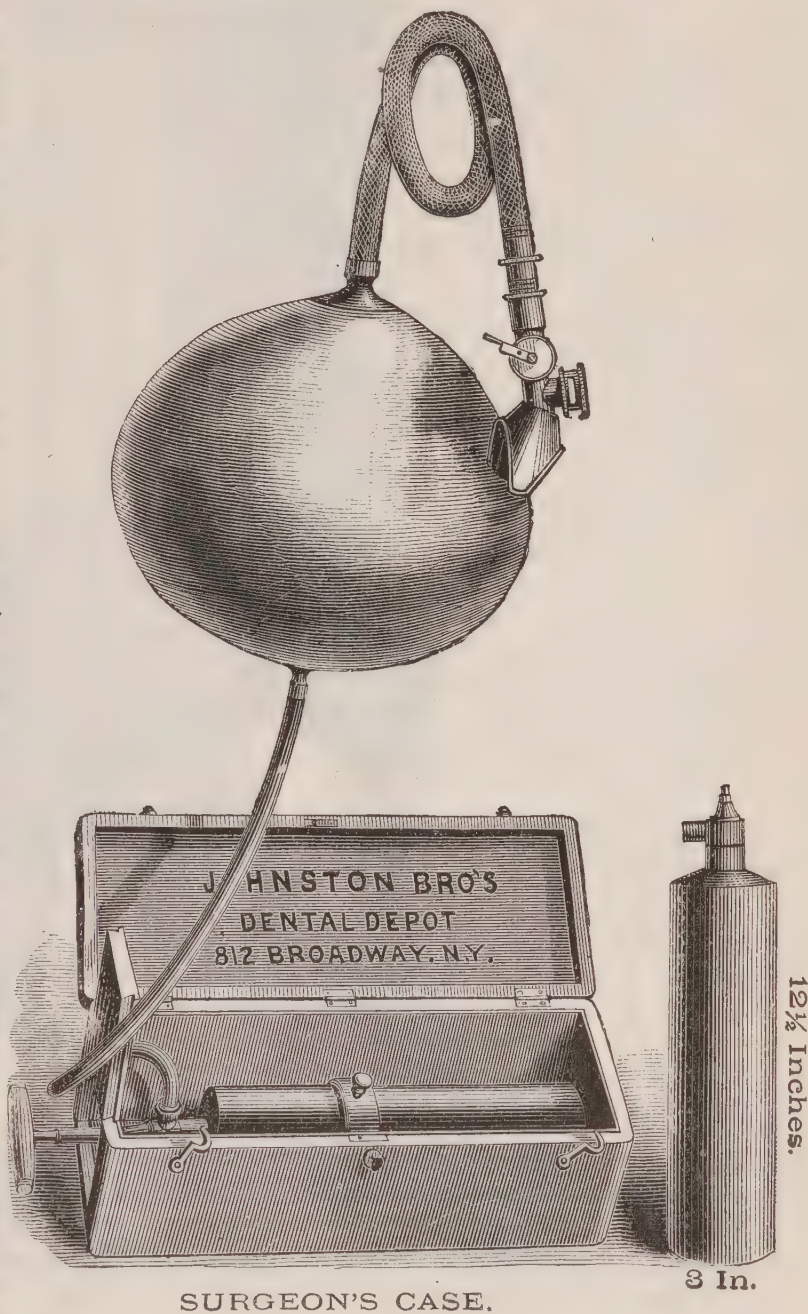
Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

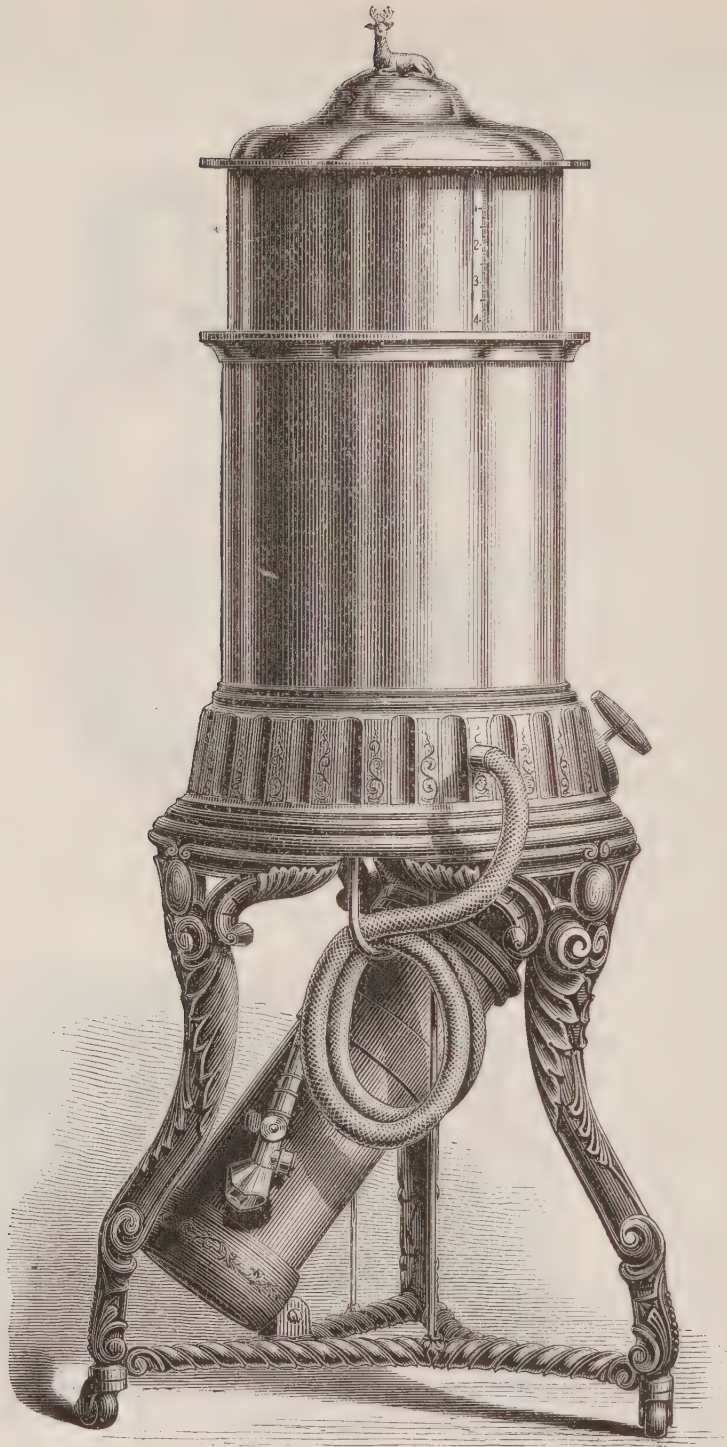
perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers

without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.





NICKEL-PLATED GASOMETER
AND ORNAMENTED STAND
FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas—this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality*.

JOHNSTON BROS., 812 Broadway, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler..... **No. 1**.....\$42 00

Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic Inhaler..... **No. 2**..... 45 00

Boxing either, \$1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas..... 16 00

Refilling Cylinder..... 6 00

Nickel-Plated Gasometer, with ornamented iron stand..... 128 00

Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered Tubing)..... 12 00

1000 Gallon Cylinder..... 36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of $4\frac{1}{2}$ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at $4\frac{1}{2}$ cents..... 45 00

Morocco covered case, with ring and thumb screw, velvet lined..... 12 00

Polished bl'k walnut “ “ “ “ “ “..... 13 00

Of these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity)..... 5 00

Rubber Bag, with covered inhaler tubing, extra size..... 7 00

Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection..... 9 50

Key, Nickel Plated..... 1 50

Wrench, “..... 50

Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag..... 1 50

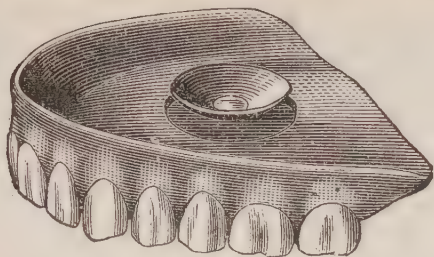
Covered Inhaler Tubing, per foot..... 50

Plated Connection to fit old style Inhaler..... 1 00

JOHNSTON BROS.,

812 Broadway, N. Y.

NEW PATENT ATMOSPHERIC DISK.



FOR HOLDING ARTIFICIAL TEETH FIRMLY IN PLACE

In Eating, Talking, Laughing, Singing, Coughing or Sneezing.

The undersigned offers to the dental profession this new and valuable device for retaining base plates securely in the mouth. Its utility has been demonstrated in over five hundred cases in my own practice. I believe it must come into general use, as no patient will dispense with it after a trial of its advantages. The Patent bears date of January 24, 1871, with seventeen years to run. Office, Town, County, or State rights for sale. Those desiring to test the disks practically before purchasing, can secure the necessary materials, ready for use, for six cases, with full instructions, by sending P. O. Money Order for three dollars.

Office rights for the full term.....\$40 00
 “ “ “ one year 10 00

Those purchasing rights for one year will be given rights for the balance of the term for \$30 more, if they choose to continue after the year has expired.

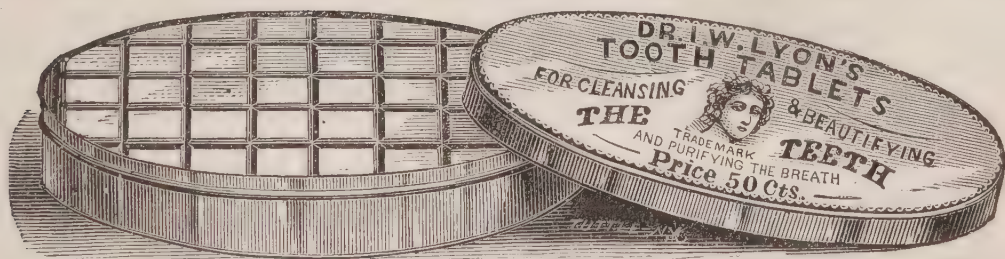
N. B. The Relyea Retainer and all other styles of disks are infringements of our patent; we shall certainly protect our rights.

Address

DR. QUINCY A. SCOTT,

Lock Box 1,015, Pittsburgh, Pa.

DR. I. W. LYON'S TOOTH TABLETS.



NOTICE—CHANGE OF BOX.

I have dispensed with the pasteboard box formerly used in putting up the TABLETS, in consequence of its liability to breakage, and have substituted a SEAMLESS METALLIC BOX, which is impervious to air and moisture, and may be carried on a journey without danger of breaking, thereby preserving the TABLETS perfectly.

Confident that the change will be duly appreciated by the patrons of LYON'S TOOTH TABLETS, I am, respectfully,

I. W. LYON, D.D.S., Proprietor,

36 Vesey Street, New York.

SOLD BY DRUGGISTS AND DENTISTS GENERALLY, AND AT THE DENTAL DEPOTS.

NEW YORK COLLEGE OF DENTISTRY,

1876-77.

FACULTY.

FANEUIL D. WEISSE, M.D., Professor of Regional Anatomy and General Pathology.

FRANK ABBOTT, M.D., Professor of Operative Dentistry and Oral Surgery.

ALEX. W. STEIN, M.D., Professor of Histology, Visceral Anatomy and Physiology.

F. LEROY SATTERLEE, M.D., Ph.D., Professor of Chemistry, Materia Medica and Therapeutics.

C. A. MARVIN, D.D.S., Professor of Mechanical Dentistry.

WILLIAM H. ALLEN, Clinical Professor of Operative Dentistry.

JOHN ALLEN, D.D.S., Clinical Professor of Mechanical Dentistry.

JOHN T. METCALF, Clinical Professor of Operative Dentistry.

WM. T. LAROCHE, D.D.S., Clinical Professor of Operative Dentistry.

WM. B. HURD, D.D.S., Clinical Professor of Operative Dentistry.

J. BOND LITTIG, D.D.S., Clinical Professor of Mechanical Dentistry.

D. W. WILLIAMSON, D.D.S., Demonstrator of Operative Dentistry.

A. RUST CUYLER, D.D.S., Demonstrator of Mechanical Dentistry.

C. P. KREIZER, M.D., Assistant to the Professor of Chemistry, Materia Medica and Therapeutics.

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Monday, October 4th, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

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—1876—

JOHNSTONS' Dental Miscellany,

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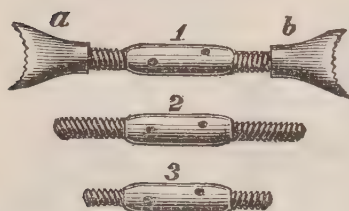
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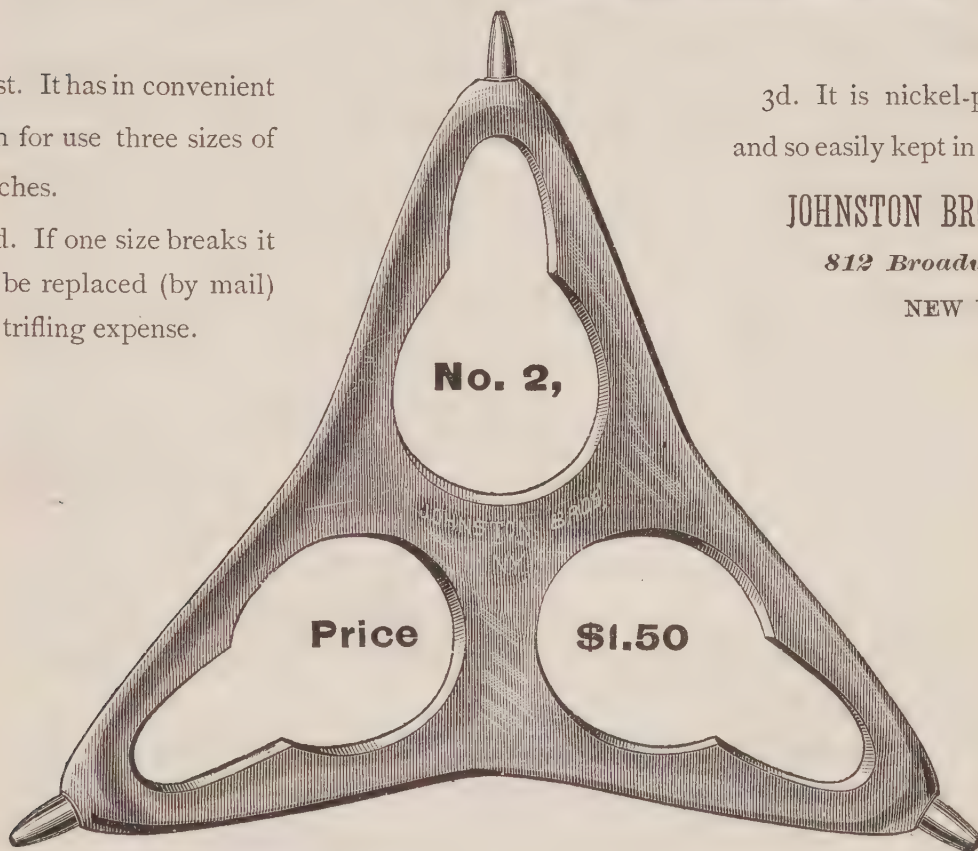


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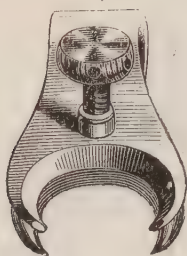
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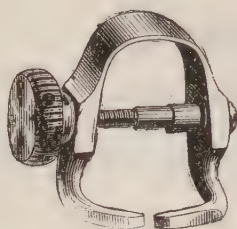
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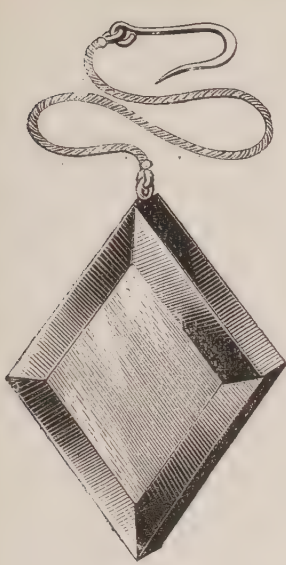
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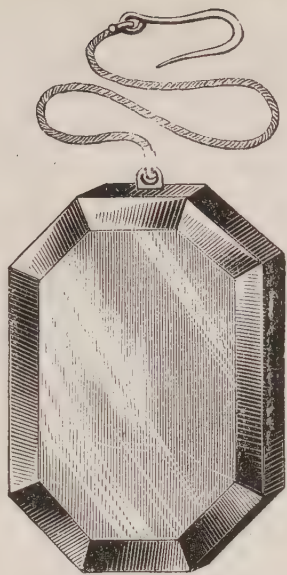
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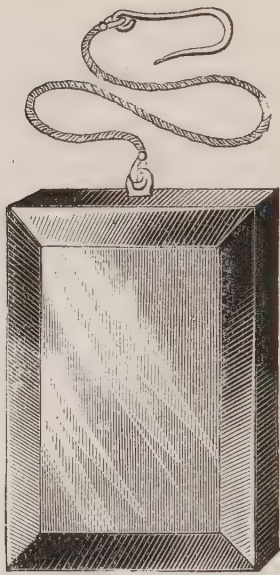
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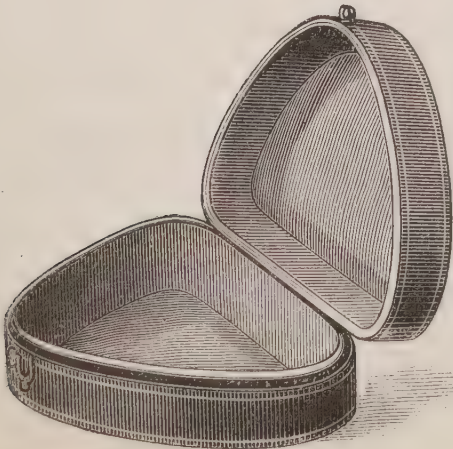
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A and B, are two clamps swiveling on each other, and encircling the rods, C and D. By one movement of the clamp, F, the padded rest, H, is held firmly in any position in which it may be placed. The rod which is fastened by G moves vertically, and admits of a range of several inches without disturbing the back of the patient.

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GENTLEMEN: After a careful examination and practical test of your new head-rest, I take pleasure in saying that I believe the movements to be admirable and ample. It is pleasing in appearance, and the only one which will accommodate ladies' hair. Also, the rest it affords for the side of the head is a very desirable feature.

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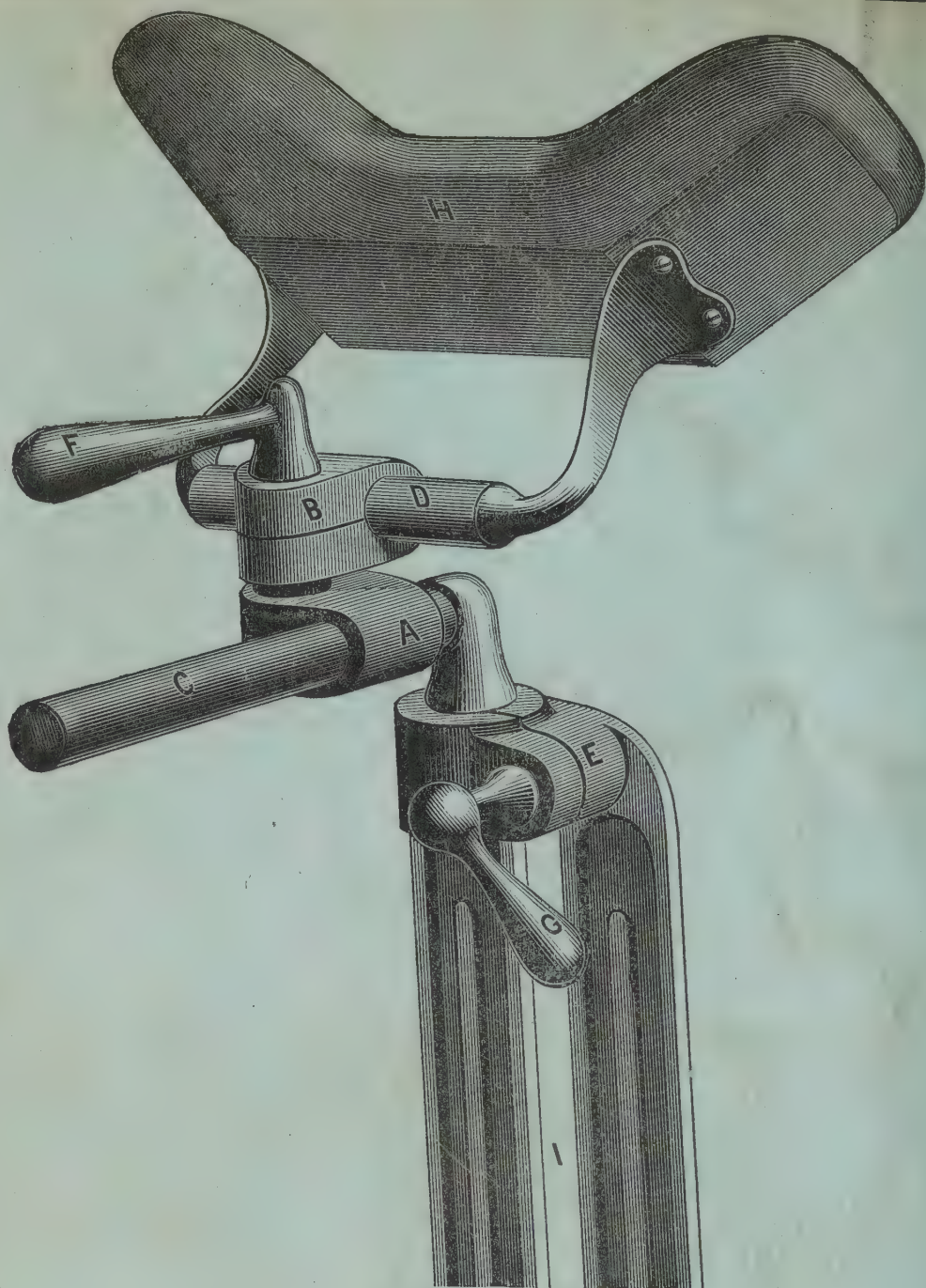
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VOL. 3.

No. 29.

Johnstons' Dental Miscellany,

A MONTHLY JOURNAL OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

MAY, 1876.

NEW YORK:
JOHNSTON BROTHERS,
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JOHNSTON'S

DENTAL MISCELLANY,

FOR 1875.

It is certainly reasonable cause of self-congratulation on the part of the publishers of this Journal, that the end of the first year of its publication finds it with a large and constantly increasing list of subscribers, and that they are constantly in receipt of letters of encouragement and commendation from their readers in every section of the country, and even from distant portions of the world, one such letter being recently received from Japan.

We are promised one or more articles from each of the following gentlemen of established reputation, and others of like standing in the profession have encouraged the expectation of like favors from them.

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JOHNSTONS'

Dental Miscellany.

VOL. III.—*MAY*, 1876.—No. 29.

THE HEALTH OF THE DENTIST.

By C. W. WRIGHT, Basel, Switzerland.

This is rather a dangerous subject I will admit, though it has been discussed and written about for several years past, and to many is one of deep importance. It is dangerous, however, when not treated in a proper way, for if the authorities proclaim from the house-tops that the calling of the dentist is an unhealthy one, and that "the average period of health in active practice for the dentist is about eight years," the result will be that from three-fourths to nine-tenths of the average practitioners will accept the doctrine, and begin to search throughout their systems for some signs of approaching dissolution of the functions. Some will discover a pain in the side, and conclude that the *liver* has been squeezed out of shape by the position occupied at the operating chair. Others will find that the side light from the window striking obliquely on the corner of the right eye tends to inflammation and ultimate loss not only of this organ, but of every thing necessary to an operator. Others, again, will discover that the fumes from sulphur matches, employed two or three times a day in lighting their annealing lamps, by entering the lungs, will produce serious difficulty in the breathing apparatus, and the *end* can be calculated upon. Some will notice varicose veins from standing. Some will have rheumatism in the left shoulder from mixing mercurial fillings in the palm of the left hand, and others will break down altogether from the nervous strain upon them caused by working six or eight hours a day at dentistry. That dentists

must die in common with other professional men in course of time, is true. That a dentist in full practice must be a hard worker is also true, and especially if he is a student of his science as well, or is engaged in teaching in the dental schools or in editing a dental journal. Dentists have been prodigious workers in the professional schools and in science. Dentists have worked splendidly for themselves, for their profession, and for the public. To these hard workers, these early and late men, is the profession itself, the position it holds in the world and the advancement it has made, entirely indebted. But as a rule, these are not the men who have had time to mourn over the "cramped liver" or the effects of a match fume. If statistics prove that dentists are less healthy or less liable to longevity than those engaged in other civil pursuits, the fact that a large number of delicate men, of men with originally bad constitutions have entered the profession, should be taken into account. Charles has always been troubled with a cough—his father died of consumption ; therefore Charles must look about for some light, genteel occupation, and as the dentist of the neighborhood, Dr. Prettyman, always looks so nice and clean, with such shiny boots, and with perhaps leisure every evening, Charles has observed him, and thinks this light office business, where the birds sing to you while you work and fishes peep at you from the aquarium, must be just the thing for him with his delicate chest. The result is one more *unhealthy* dentist to add to the statistics. Or, again, William, familiarly called Bill, has concluded that to follow the plow all during the Spring, to plant, to hoe, to feed the cattle, and then to find that on account of a drought, or a hard blow, or too much rain, the most of his labor and sweat has been in vain, is not the most encouraging of occupations. He determines on a rise in life, a change of calling, and seeing Dr. Stout in his office, with white hands, and miniature hoes and miniature threshing machines, not caring, "apparently," for rain or shine, the idea enters William's brain—"Why not go and do likewise?" So this fine, healthy country boy, with an appetite equal to one of his oxen, commences the study, and this change from exercise and free air, with his appetite and idea of a *feed*, to a student's life in confined air, soon tells on his health and spirits, and no wonder that in "eight years" William is counted as another sacrifice to dentistry. These are neither fancy pictures nor uncommon ones, as everybody knows, and yet the calling of the dentist is charged with the odium of being unhealthy. Let somebody prove if they can that dentistry, followed intelligently, with ordinary and comfortable regard for ventilation, bathing, exercise, and personal habits

and appetites, will break a man, as the saying is, or injure his health in any way, in eight years, provided that at the beginning he has ordinary good health, and is either accustomed to some indoor life, or knows enough to make a gradual but radical change of habits if he is not. I do not think it can be proved, and I think the contrary is true—that is, that the serene life, the healthy stimulus of the most interesting studies, and the occupation of the hands in most interesting operations that the dentist has, are the best means of securing health to mind and body. Like an appetite or a desire of the mind or body, dentistry in itself is a healthy occupation, though like any natural appetite it may be sadly abused. The abuse of good things should not be placed to the discredit of the good things. Let the dentist first keep his hands and brains sufficiently employed with his occupation to prevent hobgoblins of livers cramped, or dyspepsia, or mercurial poisons from frightening him. Let him forget that he has any special pet function that must be peeping at him from every dish on the table, or every hour that he remains in one place, to remind him “to take care of me.” Let him *live well* in the full sense of the word, and cultivate a faith in God and a serenity of habit, and he will be all right. If after a day’s work he feels fatigued, let him rest absolutely or play like a boy, or go to his club, or if over here let him go to his café and smoke his *good* cigar, if he is fond of it, or meet his friends in a social way for an hour. I do not wonder that the complaints of the dentists about their health is becoming almost a proverb when I see how many of them live. For instance, one of the ill ones gets up at four or five o’clock in the morning and rushes over hills and valleys in search of physical health, returns a little before eight, swallows a breakfast arranged according to some *notion* about bones and muscles, and at eight begins with his patients. At half-past twelve a good, big dinner is eaten, with a desert of pudding (this dinner taken with a glass or two of red wine), at half-past one or two business commences again, and till four the weary time is dragged out. Then, if not *too* much exhausted, some miles must be walked over to refresh and get *exercise*, and by eight o’clock the poor man is much more tired, much more worn out than any farmer in the land, and yet he has earnestly sought to keep his *liver* in motion. Dio Lewis’ notion of light suppers or no suppers are generally followed by *seekers* after *health*. Is dentistry responsible for all this? Is it natural that we should first tire ourselves out physically before being in condition to bring our minds and hands to perform dental operations? Is it proper that we should take a full meal in the

middle of our work? The dentist should arrange his hours to suit his mental and physical *convenience*; should take his *dinner* after the heavy labors of the day; should keep mind and body as clear and light and free from outside care and fatigue as possible; should forget that he has a liver or a stomach; should be cheerful and industrious, and let nature and the impulses of nature have some play. I have tried to defend the calling of dentistry against the charge of causing the ill-health of dentists. Outside of our profession I presume we are as prone to the ravages of time and tide as the rest of humanity, but no more, at least.

FACIAL NEURALGIA,

Deriving its origin from abnormal complications in the teeth or mouth.

PRIZE ESSAY, by J. F. BABCOCK, D.D.S.

An article upon Facial or Dental Neuralgia, to be in any degree exhaustive or comprehensive, is from the start predestined to be of considerable length, but at the risk of wearying my readers I must, at the commencement, erect a foundation which will afford me a substantial basis upon which the future structure of this paper may rest. Neither shall I make any apology for the conversational style in which this article is written, since it is my purpose, and will be my endeavor, to render my illustrations, assertions and deductions as comprehensive and distinct as it may lay in my power to do.

The term Neuralgia is a compound one derived from two Greek roots which signify "nerve pain," but as all pain, wherever located, or whatever its nature may be, is equally as certain to be "nerve pain," it would almost seem that the use of the term to indicate any special region of pain was, to say the least, questionable. Neuralgia, as we familiarly understand its application, does not necessarily indicate the locality of the pain suffered, but its signification is more commonly illustrative of a *condition* rather than a *cause*. My paper, however, has as its province the treatment of Facial Neuralgia dependent upon diseased teeth for its lesion, and as the citadel of Facial Neuralgia is necessarily confined to the region of the face, it may not prove amiss that upon the very threshold of this article we inquire, at least in a general way, into the *nerve* anatomy upon which Facial Neuralgia is exclusively dependent. First, then, we have the superior maxillary nerve, which

arises from about the centre of the Gasserian ganglion, traveling a more or less devious path to the points of its ultimate destination. The nerve under consideration is the second division of the fifth pair, supplying with its filaments the superior teeth, the nose, lower eye-lid, antrum, labial glands and the upper lip, together with nearly the entire integument of the superior facial region.

The inferior maxillary nerve is a compound nerve, both motor and sensory in its character, the latter portion taking its rise in the Gasserian ganglion and ultimately distributes its filaments, after having previously united with the motor portion so as to form one cord to the inferior teeth, the tongue, the integument of the lower lip and to the digastric muscles—and when in this connection the fact is taken into consideration that the posterior lower molars are situated only at a short distance from the external auditory passage, the tonsils and parotid region, and that the roots of the superior molars are close to the orbit and its contents, and posteriorly approach the sphenomaxillary fossa and fissure, then the immense area of pain, as connected with Neuralgia in the facial region, the origin of which may, and in fact does, depend upon a diseased tooth, thereby giving rise to an irritation of more or less of these nerve filaments, must to a certain extent be comprehended and appreciated, thus rendering it a simple matter to account for the sometimes serious complications which are the direct result of periosteal inflammation connected with the roots of diseased teeth. Facial Neuralgia in its strictest interpretation, and as it is made to have a definite application, consists of either a local, paroxysmal or metastical pain, the origin of which the patient cannot usually determine, there being no particular or special manifestations beyond the single fact of pain, varying in its intensity and in its locality. More commonly, however, the term Neuralgia is used by our patients in layman's parlance, and signifies almost any pain resulting, and as such recognized by the sufferer to proceed, from odontalgia, the seat of the lesion lying in one or more teeth. In the *first* instance the lesion may be equally as surely located in the *teeth*, but the inability upon the part of the patient to distinguish the fact is dependent upon what is familiarly known as *reflex action*; the lesion is in the tooth or teeth, and as such is conveyed to the brain or mental perception, but in the return the circuit is, as it were, ruptured, and at this point of rupture, where the sensation of suffering may be ultimately distributed in various directions, the illusion begins and the patient is satisfied that the teeth have no connection whatever with the agony. In the second case the patient

usually comes within our jurisdiction for the purpose of having one or more teeth extracted which local indications make it evident are the seat of the lesion, while in still others the persistent assertion of the sufferer would lead us to infer that a perfectly sound tooth in either jaw was the offender, yet we ultimately convince both the patient and ourselves that the proper tooth for treatment is a more or less diseased one in the opposite maxilla; this again is the result of reflex action, and in these cases it becomes us, as reliable practitioners, to form our diagnosis in the most careful and painstaking manner, to the end that the results of our treatment may corroborate our assertions and that we make no error which would justify the charge of malpractice.— However, when an instance of Facial Neuralgia presents to us for treatment, our first duty is an endeavor to form a proper diagnosis, searching for the cause among and in connection with the sufferer's teeth, and just here it may not be amiss for me to assert my strong belief that *all* instances of *bona fide* Facial Neuralgia originate in connection with the teeth; I freely admit, that in many cases such origin is an exceedingly difficult matter to trace to a satisfactory diagnosis; but to say to such a patient that they have Neuralgia (I fear too often the scapegoat of puzzled examiners) and to dose them with nervines, trusting that chance may give them relief, is to give them no satisfaction whatever; every effect must have its cause, and our first attempt should be to trace that cause, if it be practicable, and when found to remove it. In many instances a correct diagnosis is readily formed, the local indications rendering the examination really very simple, while in numerous other cases the effort to discover the origin of the suffering is an exhaustive and anxious one; while in others, though fortunately but rarely, repeated trials are at last merged in utter discouragement and finally abandoned. It is now my design to occupy the remainder of this paper with illustrations of some of the exciting causes of Facial Neuralgia, together with the special treatment necessary for the reduction of the lesion; such treatment it will be my earnest endeavor to render intensely practical, and such as I have personally found to have produced the best results, to the end that what is written may in its humble way accomplish whatever good its limited capacity will permit. Avoiding glittering generalities, and shunning the repetition of numerous technical terms, which serve only to confuse and not instruct the general reader, but which are too frequently indulged in in magazine articles, I will at once proceed to the discussion of what may properly be termed the pathology of the teeth as connected with the lesions of Facial Neuralgia.

The term pathology, in contradistinction to that of physiology, indicative of health, is applied to those conditions which are morbid in their character, hence it is to the diseases of the teeth and their remedies that I ask the attention of the reader for a short period ; a subject, strange to relate, which, in its distinctive character, has had but a comparatively small space allotted to it in the dental literature of the present day; but notwithstanding this fact, it would be marvelous to my mind could a discussion be devised laden with a more profound interest to us in our specialty, or of more practical importance to the community at large. It is my firm conviction that by a closer and more thorough consideration of it by the general profession than is now frequent, will follow a stride markedly significant toward that advancement and elevation of our specialty so earnestly desired by us all. The practice is extremely surgical in its nature, and one which will be a most worthy aspirant to share those honors which will ultimately give substance to that future truly professional specialty—Oral Surgery. These diseases of the teeth we should at all times be ready to combat with all the science and skill at our disposal ; a struggle of no contemptuous order it will prove to be upon many an occasion with not a few, but one which in the *great majority* of instances will eventually yield to persevering energy and the judicious use of remedial agents properly applied. For the sake of conciseness in the arrangement of those diseases which I propose to deal with in this paper, I will first designate the lesion and then follow with a résumé of the proper steps to be observed in its individual diagnosis, together with the therapeutic agencies most frequently and successfully used by me in my own practice, for its reduction. As an apology for having resorted to my individual practice in this respect, entirely ignoring any information which might have been derived from the text books, let me say that I have done so, not actuated by any spirit of egotism, but simply in order that the possible grain of wheat which may, peradventure, exist in this article, should have a thoroughly practical signification and value. First, then, let us investigate that *invariable* sequence to the procrastinations which have burdened the existence of that patient who has realized the fact of the caries, but who has considered the next week as the most “convenient season” so long, that at last a sharp and unendurable twinge of pain, growing gradually continuous in its character, has admonished him that our chair has, if we perform our *whole duty*, for once its charms, since I hold that the intelligent performance of that duty involves for such an one—I am now writing as a general thing—not *extraction*, but relief from agony, and the ultimate salvation of the

tooth, while to us as practitioners its significance consists not alone in its pecuniary gain, but far and above all, *triumph*, and the consciousness of a duty well and skillfully performed. The first purely morbid condition, other than the fact resulting from ever increasing, never ceasing decay, is an exposed pulp, and of this fact the immediate indication following the presence of a gentle irritant, is simply an uncomfortable, nervous sensation, gradually increasing in intensity, while paroxysms of pain become of frequent occurrence ; this constant irritation gives rise to extended inflammation, and an abnormal expansion of the veins and arteries necessarily results, creating undue pressure upon the sensitive nerve fibres in the pulp substance, bound and confined as this tissue is in its hardened and unyielding walls ; a steady, excruciating and limitless pain is the result. The case is in our hands for treatment, and after a sufficient examination by any method freest from suffering to our patient, our diagnosis is, exposed pulp. Under these circumstances, I consider it the height of absurdity to contemplate for a moment the salvation of the pulp by capping, or by any other method ; and just here I do not desire to be misunderstood. The pulp under consideration is inflamed to its utmost extent, short of the degeneration and disintegration of its tissues, its vessels engorged with inflamed blood are upon the point of yielding to the immense pressure put upon them, while such pressure is crowding their walls upon the delicate nerve fibres which ramify throughout the tooth's substance in every direction, in countless multitudes. The only mode of treatment in such an instance is, I maintain, to anticipate nature by causing the death of the pulp at once, and our first application, instead of being arsenic, should be carbolic acid or creosote, for the purpose of reducing the existing inflammation, since such inflammation is wholly inconsistent with, and actually opposed to the satisfactory or expected action of the escharotic. The irritation already existing in the pulp is incompatible with that which it is our desire to create as the result of the arsenic ; hence, if we apply the latter at once, as is quite frequently done with unsatisfactory results, we as a rule only aggravate the evil which we assume to remedy, and only subject the sufferer to additional and unnecessary pain, without accomplishing the object which we have attempted to obtain. If it so be that any have been nonplussed to account for the supposed inefficiency of their "paste," let them *first* apply creosote, or other antiphlogistic, until the evidences are satisfactory that to a marked extent the inflammation has subsided. We may now wisely resort to the use of the arsenic, thus creating an irritation and inflammation so excessively and so

suddenly stimulating as to cause a rupture of the vessels in a short time and thus precipitate the death of the pulp. This having been accomplished successfully, a too often (and I judge simply from individual observation) neglected step should at once be taken, viz : its extirpation, its *entire* extirpation, since if any portion whatever be allowed to remain, cause for sorrow will not be long absent; follow this by faithful endeavor in the filling of the pulp canals, first, with a pellet of cotton freely dipped in carbolic acid, and forced well up to the shoulder immediately next the foramen ; next proceed to fill the canal proper with ropes of cotton, *saturated* in the hardest quality of os-artificial, and finish with gold in the chamber and cavity of decay, never omitting to paint the gum slightly with the *ethereal* tinct. of iodine, to allay any possible periosteal inflammation which may or might ensue.

I am fully aware that there are other methods, more especially relating to the materials used in filling the canals, which meet with the approval of those who advocate them, but I have tried many others and have oftentimes not met with the success which was anticipated, whereas, with the system which I have attempted to demonstrate, I have been almost uniformly successful in obtaining the very best results. In my judgment, no treatment has ever been instituted for these particular cases to be compared, in degree of success, to that of destruction and extirpation of the pulp and filling the roots. I believe that I have saved absolutely ninety-five per cent. of the teeth which I have treated by this system, and I therefore fail to perceive any advantage to be derived from adopting a different course of treatment, which may be at least open to many doubts and of questionable merit. I say "system" in a general sense merely, since in all these cases, as well as others which I may bring forward as being lesions in Facial Neuralgia, *judgment* of the clearest order is ever required ; judgment which pen, ink and paper cannot demonstrate or render apparent; hence my term system applies only to that which written or spoken words *can* indicate. Strange as it may appear, yet, from quite an extended observation, it would seem that two facts as related above are not clearly understood by many connected with our profession. First, that when a pulp is destroyed by artificial methods, it is in every instance necessary—there can be no exception—to wholly remove it, and replace it with *some* foreign material capable of being packed most compactly and solidly (hence my preference for cotton and os-artificial); whereas, the large majority of such teeth which have fallen under my inspection have either been filled without extirpation of the dead pulp, or in other cases, in addition to such filling a

hole has been drilled in the side near the neck of the tooth, with the avowed intention of providing an escape simply for the future accumulation of pus. Second, that before the death-dealing substance is applied, it is necessary to allay and soothe existing inflammation. Had this tooth under discussion been presented for treatment *before* the patient had suffered in consequence of its pulp exposure, or had it been accidentally exposed during the progress of an operation, then the state of things is materially changed, and its salvation becomes a matter of the strictest duty, both to ourselves as members of a progressive specialty in medicine, and to our patients. In such instances capping may be *successfully* attempted with almost any of the suitable materials and methods so variously advocated, os-artificial taking high rank as a substance of which the pulp seems tolerant. My preference, however, is as follows: *gently* cover the point of exposure and surrounding portion of dentine (of course after having prepared the cavity) with lactophosphate of lime, covering *this* in turn with a small pellet of cotton barely touched with creosote, fastening the whole in position with cotton dipped in an alcoholic solution of sandrach. Allow this dressing to remain for twenty-four hours, when remove all but the lime, and introduce another layer of the lacto-phosphate, cover this with os-artificial, and when the later has hardened solidly, complete the operation with gold. The asserted theory to account for the uniformly successful results with this material is, that the lime will, in the course of some fifteen days, induce the secretion and redeposition of new or secondary dentine, which results, of course, in securing the toleration of it by the pulp, as it is a *natural* capping. It is a theory, however, which I personally reject as absurd and unreasonable, utterly so; but as the *fact* of the pulp's toleration of this substance is indisputable, I account for it, and so regard it, as a mere but most remarkable toleration of a foreign substance by the pulp tissue, while in course of time the lime itself becomes sufficiently hard and solid to permanently attach itself to the surrounding dentine, and with it forming almost a homogeneous mass, which is calculated to deceive the unassisted eye, but which, under the microscope, reveals its true character as lime, and not a secondary deposit of dentine. With this material I have treated, during the past year, forty-two cases of exposure where the pulp had never previously experienced any degree of irritation, and so far as I am able to determine, I have made *forty-two* successful treatments, having lost none that I am advised of, certainly a most remarkable percentage in its favor. I therefore feel warranted in considering it as a treatment which I can most earnestly recommend, and solicit all to try who have not heretofore done so.

Upon the other hand, had our imaginary patient, through the fear of contact with our forceps, courageously borne their suffering until nature had itself accomplished the death of the pulp, and at that moment, or very soon after the case had presented for treatment, we should undoubtedly have discovered upon concussion that treatment was required to combat periostitis, or inflammation of the periodontal membrane, which covers the roots of all teeth. It is a vascular tissue and its design is at least threefold : it acts as a cushion for the teeth to rest in, thus reducing the risk of serious results in mechanical injuries, since it is exceedingly elastic, and permitting, for this reason, more or less motion. Its vessels supply a portion of the nourishment which the tooth requires, and it affords firmness to the roots in their close relation and attachment to the alveolus. When inflamed from any cause, and among the causes are the accumulations of tartar, or by any mechanical injury, the characteristic evidences of inflammation elsewhere are readily apparent, and may be diagnosed by concussion with a moderately heavy instrument, which will develop, it may be, extreme tenderness upon pressure, the patient will oftentimes remark that it seems to them longer than its fellows, and such is really the case, the elongation having been necessary to permit the thickening and swelling resulting from its inflamed condition. These characteristics will be more or less fully developed, according to the severity of the inflammation and its extent. Just at this point of *seeming* periostitis, judgment is required to determine if the lesion may be successfully treated for *simple* periodontitis or not, since it *may be* a complication in which the *first stages* of alveolar abscess are taking an undiscoverable part, and in the absence of the later characteristics of abscess, the operator may be very readily deceived ; but if you so determine, proceed at once to deplete the gum freely of blood by leeching or lancing, the former being most preferable, since the flow of blood is so much greater, and then apply tincture of iodine to the wound, gum and adjacent parts. Cleanse the pulp canal perfectly with tepid water in which a little alcohol has been placed, when it may be filled with cotton saturated in creosote. Continue this treatment daily or less frequently, as the case may seem to require, until the tooth is absolutely free from tenderness and all normal characteristics, so far as possible, made apparent, when the canal and cavity of decay may be permanently filled, as before indicated, and with a precautionary application of iodine to the gum, your patients may be dismissed, impressing it forcibly upon their mind to return at once upon the slightest symptom of a recurrence of the trouble, when another free application of

iodine may usually be relied upon to complete the cure so nearly accomplished upon the first trial. Whatever the cause which may prove the exciting one, there is scarcely any lesion which is so prolific in neuralgic conditions as the above, and owing to the occasional fact of its being exceedingly difficult of diagnosis, I can scarcely say too much to impress upon my readers the value of concussion as a method to assist them in their endeavors. Sometimes only an exceedingly limited tenderness will be noticed by the sufferer in an individual tooth, as you pass from one to another, soreness out of all proportion to the amount of pain present; but in the absence of any other observable manifestation, *look well to the particular tooth in which it occurs*; many a neuralgic affection has thus been easily treated and eradicated. Should a purely legitimate periostitis present, *not involving the loss of the pulp*, such as may result from a blow, a severe cold, the encroachment of tartar, or from kindred causes in a tooth free from caries, or having decay which has not progressed sufficiently to expose its pulp, then diagnose as before and treat with tincture of capsicum and iodine, after having depleted the gum freely of blood; and in these cases the ethereal tinct. iodine should be preferred, since it is so much more rapid in its action, and serves with greater efficiency in accomplishing a well developed counter-irritation than the ordinary officinal tincture, or if it is preferred, three drops of tinct. aconite may be employed upon a scarified surface, but in the use of this agent much care must be exercised, since recklessness in using a much larger quantity may be followed by complications of a most serious character, which may result in the death of the party so poisoned. It is, however, moderately effective in the reduction of periosteal inflammation, and was at one time regarded as a specific, though now the discovery and introduction of other equally as prompt and less dangerous remedies have gradually caused its abandonment. Some time since I had the pleasure of successfully treating a very remarkable case of Facial Neuralgia induced by a purely legitimate periodontitis, and as it is one so clearly illustrating the intense suffering and diffused effects of such periosteal lesions, I shall venture to relate the same, trusting, however, that it may not subject me to the charge of egotism.

[*To be Continued.*]

PRIZE ESSAYS.

The committee to which was referred the essays called out by our offer of "a Suspension Engine for the best essay upon Facial Neuralgia," after a careful examination of the essays submitted for competition, reported in favor of that by "*Oral Surgery*." On opening the envelope having that *nom de plume*, and accompanying the essay, we find that the writer is Dr. J. F. Babcock, of Bangor, Maine, to whom we tender our congratulations, and take pleasure in sending the promised Suspension Engine. We congratulate our readers also in the reception of a paper of so much thought and originality on this difficult subject.

We hope that the unknown authors of the essays which are not reported upon will not cease their efforts before we have the opportunity of sending to each of them a like prize, in conformity with subsequent offers.

They doubtless feel that the mental gain made in the preparation of such papers is a far greater reward than any material compensation which falls to the portion of the successful contestant. Of course it is better to have the mental exercise and the prize too.

We again offer a prize—this time a Surgeon's Case, No. 1, \$43.00—for the best essay submitted under like conditions as this last (which were made in our February number, page 88) on "How best to establish a Dental Practice," or on "Dental Architecture."

Let the real name of the writer be inclosed in a sealed envelope which externally bears the same *nom de plume* as is affixed to the essay.

All essays will be submitted to the committee for examination on the 1st of August next. We hope that we may hear from many of the more experienced of the profession on one of these subjects—even though they may not be tempted to write by the prize offered. [ED.]

DENTAL ADDRESS.

Delivered before the Alumni Association of the Pennsylvania College of Dental Surgery by Dr. G. W. KLUMP, of Williamsport.

Gentlemen of the Pennsylvania College of Dental Surgery: While I rejoice to be an alumnus of a college which has so many men of eminence and renown in the profession among her graduates, as has our *alma mater*, and while it is a great pleasure to meet them in association

assembled to devise means for advancing the interests of the profession in general and of this college in particular, it is a still greater pleasure to be permitted to address you upon this occasion ; yet I would gladly forego this pleasure, and yield to others more competent, were it not that the honors you have been pleased to confer upon me bring with them the imperative duty of an address.

Dentistry, as a profession, is of a comparatively recent date. While it is true that both operative and mechanical dentistry were practiced in the gray ages of the past, under kings whose tombs are pyramids, and whose statues outlived the arts and sciences they fostered ; yet the subsequent dark ages that covered the earth with a pall threw its black shadow across our profession so that it was hidden for thousands of years by more than Egyptian darkness ; so that even in this nineteenth century of Christianity and the first centennial of our nation, we find our science in the early morning of its existence.

As this first centennial of the independence of our nation shows her to the world crowned with higher honors, loftier achievements, and more signal triumphs than any other nation ever won in a like period, so may the centennial of the establishment of dental colleges show triumphs and achievements which will win from the appreciative and exulting world of art and science a like ovation.

While we take inferior rank to foreign nations in the arts and sciences generally, it is somewhat flattering to our national vanity, and particularly to our profession, that Americans are universally acknowledged to lead the world in the art and science of dentistry. But it is greatly to be feared that unless radical changes are made in our laws, requiring of us higher scientific attainments before being admitted into its ranks, that notwithstanding our numerous educational institutions, we will in the future be compelled to fall behind in the race of progress.

There is a constantly increasing demand for more thorough professional training as our sphere of usefulness is developed and recognized. Though greater powers and higher possibilities are in store for us in the future, yet we have reason to feel proud of the position we now occupy as a profession. Even within the recollection of some of the alumni of this college, it had advanced but little beyond the rude and imperfect condition which characterized it in its infancy. Born in ignorance and poverty, nursed by the blacksmith and barber, it was beneath the notice of the medical profession, to which it looked for sympathy and encouragement.

Being thus driven early to rely upon its own resources, it advanced

with the rapid growth of the natural sciences, and becoming estranged from its unnatural mother, and struggling for existence, it by degrees emerged from the atmosphere of routine and empiricism, and marked out for itself an independent professional career.

Less than half a century ago a few earnest, devoted philanthropists, Harris, Hayden and their compeers, who imbibed their spirit of enthusiasm with a sincere desire to benefit mankind and elevate dentistry to the dignity and importance to which it was entitled, were endeavoring to bring out of chaos something at least approximating a liberal profession. To these men of indomitable energy and perseverance do we owe, more than to any other cause, our profound gratitude and appreciation, for first placing dentistry above the level of the ignorant quack and disappointed mechanic.

This was the dawn of a more glorious career for the profession ; from that time forward, steady, if not rapid progress was made, and, as the light advanced unto the more perfect day, and the members met and learned to know and understand each other, a more liberal spirit began to prevail. Instead of looking with suspicion and distrust upon their professional brethren, and locking their ideas within themselves, and closing their offices and laboratories against their brethren, they began to vie with each other in making their improvements and contributions public, thus benefiting the profession and the community.

Dental literature began slowly to multiply and text books gradually to increase. Although the supply of works exclusively dental is yet meagre, respectable additions are constantly augmenting it. New dental colleges have been established, and thus opportunities increased for students to prepare themselves for professional duties with a greater degree of perfection.

But colleges have not alone increased—other facilities for obtaining a more thorough dental education have also improved ; yet, notwithstanding all these facilities, many, aye, the great mass, fail to avail themselves of the advantages offered. Being destitute of a just conception of their greatest need ; having no adequate idea of the importance of dental education, they are not only willing to plod along in the darkness of professional ignorance and the blight of self-conceit themselves, but often in a few months, or even weeks, pretend to prepare others, and thrust upon the public these would-be dentists, even more ignorant than themselves. Thus scores and hundreds of so-called dentists are made, to drag down the profession, while the number is in comparison small who are prepared by legitimate practitioners, from students se-

lected for their ability and willingness to remain a sufficient time to prepare themselves properly and graduate before entering upon the responsibilities of a dental practice.

Discouraging as such a state of things is, we must not become disheartened, but should rather be encouraged to put forth greater exertions to raise the profession above the level of these worthless pretenders. Our great object should be to devise the best means of advancing the educational interests of the profession, and extending its benefits so as to do the greatest good to the greatest number. We, as individuals, should begin in our offices by instructing our patients and thus benefit the public and the profession. It is our duty to act in the capacity of teachers to those who place themselves under our care, by patiently instructing them in regard to their teeth, the relation they sustain to their beauty, health and comfort, so that they properly appreciate them; this is implied in our very title, and if it were faithfully and persistently carried out by every dentist, the public would soon recognize the worth of our services, and acknowledge us with all the consideration due a liberal profession that is laboring for the amelioration of human suffering.

We must also show a more liberal spirit; be ready and willing always to praise true merits in a professional brother, and take him by the hand and wish him success, even though he be our rival.

There is nothing that so much hinders the advancement of the profession and lowers it in the estimation of the educated and refined, as the constant petty bickering and jealousy so often indulged in by its members.

We also owe certain duties to dental colleges in general, and these are especially imperative to our *alma mater*.

As individuals we should ever advocate and encourage collegiate education as the very best means of advancing the art and science of dentistry. We should also take greater pains in selecting students, and imperatively demand their attendance and graduation at a dental college as the main condition upon which they are received. We should take a deeper interest in the welfare of our *alma mater*; feel solicitous that she retain a high standing among the institutions of learning. We should heartily sympathize with every effort she makes to raise the standard of qualifications or enlarge the curriculum of study, and should be ready and willing to encourage and assist her with our time, talents or means. But though we be unable to do some great things to which we aspire, let us not be too modest or unwilling to employ whatever tal-

ents God has given us in securing a higher and more liberal culture for our profession, and selecting more intelligent pupils and remunerative classes for our College. We, as individuals, should encourage in the formation of Dental Associations, and in every way possible promote free scientific discussion of every topic which appertains to our profession. This would do much towards breaking down professional jealousy and dissipating the prejudice and narrow-mindedness that yet remains as a relic of ignorance and barbarism.

As an Association, however, we are still more powerful in accomplishing advancement in our educational interests if we work unitedly in this great cause. Besides the good which these meetings do to the individuals who assemble here, much more can be done through them for the college and the profession. If we neglect our duty in this respect, and fail harmoniously to concentrate attention upon a subject of so great and acknowledged importance ; if we are not painstaking and conscientious workers, endeavoring to exhaust every available resource that will benefit and improve our college ; if we are not earnest and persevering in our efforts to secure a more enlightened harmony of views, then we fail to perform the duties reposed in us as the alumni. We are the centre of a great educational power, and are enabled to produce changes that will improve and benefit our *alma mater* and give her new incentives to advance ; an institution that has had the success, the prestige and influence of our college undoubtedly should have an alumni association that has the ability and power, and that is ready and willing to take the responsibility of suggesting measures of improvement for her reputation and usefulness. While it is but natural that this association should feel deeply solicitous for the success and general welfare of the institution from which its members have received their diplomas, it is equally obvious that any suggestions made by this association for improvement or reform would be duly considered by the faculty, and additional weight given on account of the friendly relations we sustain to them.

If we, therefore, are thoroughly convinced that certain changes are demanded in the college, they should be recommended without fear of transcending our privileges ; but we should be exceedingly cautious that in our enthusiasm for the cause we do not engender strife and discord without a compensating benefit being derived.

Whether it be impracticable or visionary to attempt to raise an endowment fund to place the college upon a more substantial basis, is for us to decide. If we are willing to do what we can in this direction,

sufficient ought to be raised now, so as at the least to be of great assistance in placing the college upon a better footing, and in the future the whole amount might gradually be secured. This idea is not new, but shall we allow it to sleep without any action?

Excepting Dental Colleges, Dental Associations have done more to cultivate the higher powers of the mind and nobler impulses of the heart than any other adjuncts to dental education; it would seem, therefore, to me, that every graduate, every member of the faculty, every friend of dental education, should be an enthusiastic friend and supporter of dental associations, because they break down narrow-minded bigotry and self-conceit, conduce to social as well as professional intercourse, and sow the seed of fraternal affection where enmity ruled and flourished. While these higher and better motives should govern us in our intercourse with our professional brethren, they should be equally prominent in our attitude to other colleges. Much harm and injustice may be done by even crediting some of the insinuating reflections in regard to other institutions, to say nothing about assisting in their circulation. The various colleges should manifest a more liberal and fraternal disposition toward each other, and reciprocate the courtesies due each other, and thus teach by *example* as well as *precept* that they belong to a liberal profession, and are endeavoring to instill principles of good fellowship and liberality among its members.

Whether practicable or not at this time, it is universally considered favorable to the advancement of the profession to require preliminary examinations. Experience shows that those who start with well developed powers of mind will soon outstrip those who have received no preparatory training. Did one college only adopt this plan, it would be enabled to send out graduates of higher attainments, who would wield greater power and influence in the profession, and this would soon give such college a higher place among the institutions of learning, on which account it would naturally be preferred by the more intelligent students, and the better qualified and more scientific preceptors.

That legal enactments to regulate the practice of dentistry would very much improve those who are now in practice, is not to be supposed. But is it not a move in the right direction? As soon as the the several States require graduation or submission to an examination in all who hereafter enter the profession, just so soon it improves the profession by eliminating such as have neither ability nor desire to prepare themselves properly, and by encouraging the more ambitious to place them-

selves far above the disabilities of legal enactments. Beneficial results have universally followed such laws wherever they have been in operation.

Gentlemen, the cause of dental education is worthy our best thoughts and energies. We have accomplished much, and considering the youthfulness of our profession can make a respectable showing. But in this age of intellectual activity we must unite upon a more intelligent basis of agreement, and, in unbroken harmony, drag, as it were, the profession out of its slothfulness and stagnation, so that it may be equal to the demands of the future. We dare not feel satisfied with our present status, but must ever advance onward and upward to higher powers and grander possibilities. But let us not forget in our enthusiasm that everything must be adjusted and regulated by the laws of science, and that therefore real progress is slow and gradual. Every genuine reform in education must harmonize with the laws of life and health, and we must find in true science the lamp to light our profession in its pathway of progress and beneficence. Some of you may be giants to help it in its onward march. We may all be earnest, even though humble workers in its cause.

I sincerely thank you for the honor you have conferred upon me, and for your uniform kindness extended to me, and sincerely hope that we may have a pleasant and profitable session, and that when the time arrives for celebrating the centennial of the profession, our successors shall have reason to acknowledge that we have not lived in vain.

LETTER FROM FRANCE.

5 Quai Masséna, Nice, France, April 24th, 1876.

EDITOR MISCELLANY,

SIR: Will you allow me space enough to contradict a statement made by "Vagrant," in his London letter published in your *March* No. of the "DENTAL MISCELLANY?" He there says, "There is an American dentist in the south of France at a winter resort who *publishes his price-list*," and then proceeds to deal out his, ("Vagrant's,") impertinent opinion as to his merits and his need of "elevation."

As an American I am *very fond* of smart fellows who "*do criticise*," for I am of the opinion that a little just and true criticism makes us see our faults and try to avoid them; but when I find *this clever* fellow makes

his "critique" on *utter untruths* (to use a mild term), as an "American dentist practicing in the south of France," I must quietly and *flatly* deny the justice or even the DECENCY of *such criticism*, as *he* calls it.

Allow me to state from a *personal* knowledge of *all* the "winter resorts" in the "south of France," that *no American, English or any other kind of a dentist* who practices in this part of the world *publishes his price-list*, and I defy any one to prove it.

This "Vagrant," then, seems to be a very *tramp* indeed, and he reminds me of one of our *smart* reporters of a *flash* paper at home, who, when he hears through a *friend's friend* who had it from a "party" that some smoke was seen coming from a chimney, he incontinently rushes into print with a large header of "HUGE CONFLAGRATION," when in fact there was but very little smoke and *no* fire; for my part, however, I feel like the old patriarch, who calls his *innocent*, clever boy to him, when he has "gone astray," and *forgiving him* for the "good" that he *hath done*, says to him "bless you, my child, *go on*, but *do better* and don't make any more statements *until* you are sure of your *facts*."

I would like also to say a few words to him about his so-called *criticism* of our last meeting of the "American Dental Society of Europe," but as perhaps others may enlarge on that theme, I will merely say that *if* we did only discuss "*old subjects*," *surely, at least*, they were *new* to many of the yet *unelevated* portion of the profession that "Vagrant" wishes to improve on this side of the water, and I *think* I can promise him, if he does us the honor of his company at our next meeting at Paris, in August next, that he will hear of "something to his advantage," and even perhaps a *little* that may be entirely new to him.

With the best and kindest feeling to all fair critics,

I am sincerely yours, THOMAS LINN, D.D.S.,
Nice, France.

THE HYGIENE OF THE PRINTED PAGE.

Nearly a year ago, a writer in the *Boston Medical and Surgical Journal*, raised the question, "Should printed lines be short?" The following extract gives the gist of the article :

"If the New York *Times* or *Tribune*, the Boston *Post* or *Advertiser*, should widen its columns to the length of ten or fifteen inches, it would, in a short time, lose all its readers. If you undertake to read a page of

the *North American Review*, and then one of *Littell's Living Age*, you will find the latter much the easier reading. Or, to make the comparison more effectual, suppose you read a page of one of the English reviews and then a page of the same article in the American review, the former having lines of five or six inches in length, the latter not much more than half as long. Or consider more particularly the great difficulty in reading legal documents, insurance policies, gubernatorial proclamations, college diplomas, and the like, the lines of which may be twelve inches, twenty inches, or two feet long; no one reads such papers if they can help it.

“And the reason is the necessity of moving the head on its axis, to turn the eyes from the left to the right, and *vice versa*; but still more, and what is a vastly greater evil, the constant demand on the eye to change its focus in order to accord with the varying distance from the eye to the extremes and the middle of the line. Some persons would perhaps deny that any such inconvenience is experienced. These persons have probably considered very carelessly their own sensations, and make very little allowance for those of others. Such persons, too, have very likely paid little attention to the reason why some print is less attractive than other print.”

Another reason, in our opinion, why both written and printed lines should be short is the difficulty of “keeping one’s place,” in going from line to line, when they are long. On this account, an epistle written on note-paper is easier to read than one on letter-paper, and this may partially explain why the former size has become more popular. It is also one reason, if not the chief reason, why “leaded” print is more easily read than “solid” matter in the same size of type. A near-sighted person feels this difficulty more than one does whose vision is normal; though the latter will, we think, be conscious of it when reading under unfavorable circumstances, as in a railroad train or with imperfect light.

There is also a relation between the size of the page and the ease and comfort with which we read it. Other things being equal, a small page is better than a large one, especially in a book. The large pages of newspapers can be folded so as to bring a limited space before the eye at once, but we cannot do this in the case of a bound volume. It is an inconvenience to have to do it with the newspaper, and this may be one reason for the growing popularity of the “quarto” form. If a journal is to be bound up, it ought not to have a page larger than the one now before the reader. Larger pages may be required for some of the illustrated journals, but a bound volume of such a periodical, though

one may enjoy looking at the pictures, is fearfully hard reading, especially for those who are at all near-sighted.

The chief advantage of the small page is that it may be easily held at the most comfortable angle before the eye. The big book, too heavy and clumsy for the hand, must lie on the desk or table, and unless the type is of liberal size one must bend or stoop over it, in order to read the greater part of the page. To the severe strain upon the eye are added all the evils of a cramped and unnatural posture of the body. The volume may be supported by a book-rest, but this is at best merely a mitigation of the evil. Such a contrivance, however, ought to be used to a greater extent than it is, especially in our schools, and by students generally. Much of the unhealthy bending over desks might be obviated by the use of some simple and cheap support for the quarto geographies and other large-paged books, and of lexicons and the common school atlases of a more advanced course of study.

Dictionaries are almost invariably the worst of books, from our present point of view. The page is large, the type is small, the book is heavy. This is inevitable, perhaps, on account of the necessity of crowding so much matter into a single volume. To put it in several volumes would not only add greatly to its cost, but also make it less convenient for its purpose. There might, however, be an improvement in the abridged dictionaries used in elementary work. For ordinary high school use, for instance, why should we not have English, French and Latin dictionaries in large, clear type? The volume would have to be somewhat larger, but need not be unreasonably bulky, and the gain in size of type would more than balance the loss in ease of handling.

We may remark here that the "vocabularies" appended to many of the school editions of the classics seem to us particularly objectionable, on account of being in type much finer than the body of the book. The pupil in learning his lesson is continually turning from one size of type to the other, now looking at a word in the text, and now at its meaning in the vocabulary, and the strain upon the eye in accommodating itself to the two kinds of type is very great. Let any one place before himself two pages of large and small type, and turn rapidly from one to the other, reading a line or sentence of each, and he will get an idea of this optical strain. It would be better to use larger type in the vocabularies, even if twice as many pages were required for it; but in many cases space might be saved by omitting superfluous definitions.

For ordinary reading, as we have said, the small book that can be held in the hand without weariness is better than the big and heavy one; and

the problem for printers and publishers is to furnish good, legible type in this "handy" form. That the problem can be solved, and in a tasteful and attractive manner, is shown by the "Little Classics" lately brought out in Boston, which seem to us quite faultless from a hygienic point of view; and to this fact their immediate and marked popularity is probably in no small degree to be ascribed. The new edition of Hawthorne, in the same style, is having a good "run," and we believe this is mainly due to its form. We hope to see similar editions of all our standard authors, especially those which have hitherto been accessible only in clumsy duodecimos or clumsier octavos. There are books enough that must inevitably be bulky and heavy; let us have small and handy ones when it is possible.

The binding of a book is a matter that comes partially within the scope of our subject. We object, on hygienic grounds, to that close, tight binding which makes it impossible to lay the page flat before the eye. Reading on a curved surface tires the eye, which must accommodate itself to the varying distances of different parts of the line. It is a common mistake, also, to make the inside margin of the page too narrow, so that if the volume is tightly bound it requires a special effort to see the inner end of the lines.

We have by no means exhausted the subject, and may resume it hereafter.—*Boston Journal of Chemistry.*

MUSEUM GODEFFROY.

BY PROF. HENRY A. WARD, in *Popular Science Monthly*.

In one of the quarters of the "old city" in Hamburg, untouched by the great fire of 1842, is a little square around which crowd tall, narrow buildings with high, pointed roofs. The quaint architecture, the flat barges in the canal, and the queer trucks with harness enough on each horse to stock a team of four, remind one of the middle ages; but the busy railway-station near by and the forest of shipping on the Elbe bearing the flags of every civilized nation tell us that this is the great commercial port of Northern Europe. Here lives Herr Cæsar Godeffroy, one of the merchant-princes of Hamburg, whose ships for half a century have been sailing over every ocean. His great wealth has been expended liberally and in many ways, as Hamburgers all bear witness. But in one unique method Herr Godeffroy has long been doing a great

work for science in Europe—a work that has made his name honored among the *savants* of Germany. This is the originating and sustaining an immense museum, now called after his name; an establishment which has for its object the collection and distribution of zoölogical material, especially in the department of the invertebrates.

Herr Godeffroy had a deep love for the beautiful and rare in Nature, and his captains brought to him contributions from all seas. This plan he encouraged, and finally enjoined it upon them, furnishing them before each departure 'with nets, dredges, casks of alcohol, and other equipments for collecting largely wherever they went. Most of his ventures were among the South-Sea Islands, and thence came to him splendid crustaceans, mollusks, star-fishes, sea eggs, holothuria, corals, sponges, sea-fans, and the like. The collection as received increased so overwhelmingly in quantity and variety (for this systematic and princely research had developed a marvelous wealth of new forms), that Herr Godeffroy determined to make it available to science in the fullest manner possible. So he gave up one of his warehouses, fitted it up from cellar to garret for the storage and handling of this material, and engaged curators to assort and put in shape for permanent preservation the fresh arrivals. Specialists were also enlisted to work up each department, identifying the old and describing the new. Thus, some of the most distinguished German naturalists were employed in this great storehouse of Nature's wonders. Some of them even found here opportunities for wider comparison of species than in the Royal Museums at home.

In other cases material was sent to the highest authorities in the various classes. Profs. Kölliker and Spengel, for example, have worked up the mammals; Sharpe (of the British Museum) and Drs. Hartlaub, Finsch and Gräffe, the birds; Prof. Peters, the amphibians; Dr. Gunther, the fishes; Semper, the insects; Dunker, Monson, Martens and Garret, the mollusks; Lutken, the echinoderms; Dr. Kirchenpauer, Kölliker and Semper, the coelenterates; and Dr. Ehlers, the protozoans.

This plan, most liberally sustained, has resulted in giving the Godeffroy Museum a high place among the cabinets of Europe for its many type-specimens and novelties. The duplicates were freely distributed to institutions of science in Fatherland, and to many specialists beyond it. This munificence in thus aiding investigators is a theme of praise among professional zoölogists on the Continent. Many of the discoveries among the lower forms of marine life which have enriched German science during the last two decades may be credited to the Hamburg storehouse. Rarely have wealth and liberality been combined in a way more grate-

ful to working naturalists, and never did science indirectly receive greater material benefit from one not himself an investigator. For Herr Godeffroy is a merchant, spending most of his time in his counting-room and at the Bourse, and superintending cargoes which unite Hamburg with nearly every part of the world. He visits his museum for an hour or two as a weekly recreation, looking over the beautiful forms, and hearing from his corps of workers their most noteworthy observations. It is a phenomenon too rare in America ; nor is it common even in more intellectual Europe to find commerce and science thus sharing the attention of the same mind. A Berlin naturalist, who was in a position to know, told the writer that Herr Godeffroy had for many years in the early part of his enterprise expended not less than from six to eight thousand thalers each year in procuring and working up his natural history material. It was perhaps to lessen the burden of this outgo by an income, and to make the institution in part self-supporting and therefore more permanent, that in 1865 (?) the founder decided to offer for sale to European naturalists his stores of duplicate material already acquired and daily coming in. For this purpose a carefully-prepared catalogue of the Museum Godeffroy was issued, with a detailed list of the species in classified order, giving the author and locality, and the catalogue number which follows the specimen when it goes forth. This catalogue is in itself an almost exhaustive list of marine invertebrates in the regions which the Godeffroy collectors have visited ; and what gives it peculiar value is its reliable indication of the locality of the specimen, coming as it does from a trained collector sending direct to the establishment. The fifth catalogue, issued in 1874, is a pamphlet of 252 pages, and notes, in close print, the name, author, locality and price, in Prussian currency, of about 9,600 species of insects, crustaceans, mollusks, echinoderms, coelenterates and protozoans, besides several hundred vertebrates. Much of this invertebrate material is in alcohol. The skillful use of this, by both collector and curator, has allowed the preservation of a large series of forms which are seldom offered for sale at a natural history establishment. Such are beautiful coral-polyps and other zoöphytes, physalias, velellas, pyrosomes, salpidæ, ascidians, holothurians, arachnidæ, minute crustaceans, polyzoöans, tunicates, and many other forms of extremest interest to the student, but heretofore rarely obtainable. In a word, the Museum Godeffroy, as now conducted, is a vast storehouse of material available for the cabinets and laboratories of working naturalists and teachers of comparative zoölogy in all parts of the world. It affords a splendid opportunity to our college professors

to obtain those forms so needed in a systematic course of zoölogical lectures or in rounding out the ordinal divisions in their museums.

It may be wondered that so little has been known of this Hamburg "Zoölogical Comptoir" in America. The reason is to be found in the extreme (we had almost said unfortunate) delicacy of Herr Godeffroy, who has never been willing in any way to publish this as a commercial establishment; even the catalogue gives only on one page, accidentally as it were, the facts that the objects are for sale.

The enterprise is carried on purely in the interests of scientific discovery at a yearly expense, beyond returns, of several thousand dollars. The staff of collectors, equipped and kept in the field, is very large. Among those specially engaged at present are the following:

Herr Hildebrand is dredging in the southern part of the Red Sea and along the east coast of Africa, and interior in the Somali land, a region whose fauna is little known. Herr Dämel is at work in Eastern Australia, having passed through Queensland and penetrated three hundred miles into the interior, obtaining strange forms of mollusks and that strangest of fishes—the *Ceratodus Fosteri*. Six of these fishes, about two feet long, have been secured by him, and six German museums have got these ichthyological treasures at two hundred Prussian thalers each. Also in Australia, Frau Dietrich, a second Madame Ffeiffer, for the last ten years has been traveling and collecting for the Godeffroy Museum. Her collections of insects are astonishing in the number of new forms brought to light. In the rapturous South-Sea Islands—Samoa, Viti, Pelew, Society, Marshall, and others—Herr Kubarz and Dr. Garret have resided for more than ten years, cruising from island to island and making magnificent collections of polyps, echinoderms, mollusks and crustaceans. The observations of these educated naturalists are familiar to the readers of the "Transactions" of the German zoölogical societies. For a long time the discoveries of this large party of expert collectors were thus freely contributed to the various scientific publications of Germany and Great Britain. But in 1873 Herr Godeffroy commenced the *Journal of the Museum Godeffroy*, a thick quarto issued in four yearly parts. This journal contains the elaborate report of distinguished naturalists on the series of specimens submitted to them. Thus Milne Edwards, of the Garden of Plants at Paris, has described the crustaceans; and Lutken, of Copenhagen University, the echinoderms; and Dr. Gunther, the celebrated ichthyologist of the British Museum, the fishes. The *Journal* is profusely illustrated with colored cuts, and takes high rank for its beauty and scientific value.

Such is the remarkable Museum Godeffroy. As a storehouse of material for the benefit of working naturalists it stands unique; and as an auxiliary to the purest, highest research, it is one of the signs of the times that wealth is not absorbed in material interests; that commerce counts it an honor to contribute to original investigation. May the number of such men increase and such institutions multiply!

DIVISION OF THE LOWER JAW.

AN INTERESTING CASE BROUGHT BEFORE THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN BY MR. C. J. FOX.

Mr. Charles James Fox said a patient had come under his care that morning at the Dental Hospital of London, whose case he had deemed of sufficient interest to bring before the Society. The patient had a most decided division of the lower jaw on each side between the right lateral and canine, and between the left canine and first bicuspid, the central portion containing the left canine and four incisors, forming a confused mass, half an inch lower and more forward than the two side portions, which nearly approximated over and behind the central portion. There being no history of violence either by a fall or a blow, the present condition of the jaw, which had existed twelve months, could only be the result of disease, and on inquiry it proved that the man had been a severe sufferer from syphilis. He was a gardener, and said he was and always had been a very temperate man, otherwise it was possible that a fall might have caused the fractures at points weakened by necrosis. Knowing the interest Mr. Christopher Heath takes in such cases, he (Mr. Fox) had shown this patient to him, and he might, before sitting down, mention that at page 21 of that gentleman's work on diseases of the jaws they would find drawings which would fairly represent this case when the central necrosed portion was removed and the two sides had united. The patient was then brought in and examined by the members, and after he had withdrawn—

Mr. Charles White asked Mr. Fox if it were his intention to treat that case mechanically. He had a short time since seen a somewhat similar case, where, from the result of a blow and subsequent inflammation, a portion of the inferior maxilla, to the extent of three-quarters of an inch on each side of the symphysis, had become necrosed and had exfoliated. In this case, the greatest relief was afforded by supply-

ing a vulcanite frame supporting the missing teeth, and keeping in perfect apposition the two sides of the jaw.

Mr. Oakley Coles said he thought Mr. Fox's case was one of exceeding interest, not so much from the characteristics of the disease as from the situation in which the disease had shown itself. The central fragment appeared to be quite detached, and the necrosis to have commenced at the lower part of the jaw rather than from the upper part, and this was further borne out by the evidence that the gland on the left side was considerably enlarged and thickened, and there was also a fistulous opening underneath the chin. He had only seen one other case like it, and that was where the disease of syphilitic origin commenced in the gland, and produced a fistulous opening, and afterwards a piece of bone became necrosed. With regard to the treatment of such a case, he did not know how far Mr. Fox desired to have a discussion upon it, but for his own part he considered it would be far wiser to leave the case alone until the necrosed bone and the teeth came away of themselves, rather than to attempt to remove them, as in the removal of the teeth there would probably be set up an amount of irritation that would involve a considerably larger portion of the jaw than was at present subject to the disease. Further than that, he believed that in old syphilitic cases if the patient were placed upon a course of iodide of potassium and the general health looked after, as soon as the bone came away there was very great effort for a reparative action, so that, as would probably be the case in the present instance, fibrous tissue would be formed, affording a union between the two fragments of jaw, until artificial means could be used with far better result than by keeping the two halves of the jaw separate by a mechanical appliance. He merely threw this out as a suggestion based upon his own experience.

Mr. Fox said he should be exceedingly pleased to receive any hints from gentlemen present. He thanked Mr. Coles and Mr. White for what they had said; but unless he saw reason to modify his view by what he might hear at the meeting, his own impression was that he had better remove the teeth that were projecting so much, and then wait until the sequestrum was ready to be removed. He would, as soon as possible after the removal of the teeth, make a plate to keep the parts in position, and hope for a union to take place, after the removal of the sequestrum at the proper time.

Mr. Turner said it seemed to him that the cause of the division and approximation of the lower jaw was due to muscular contraction, the

fragments being deprived of the keystone that kept them in position—namely, the centre part at the symphysis of the lower jaw. If they allowed this amount of contraction to go on unchecked, when the sequestrum was removed it might be found that there was considerable difficulty in regaining proper power over the muscles. They knew very well that it was bad practice to hurry the removal of a sequestrum. If they tried to remove it by force, they would very likely do harm; on the other hand, if they waited till it was thoroughly liberated, they could remove it with great advantage. Still, while they were waiting there was a great deal of mischief going on. Therefore, if an internal splint could be applied to the lower jaw, to keep the fragments apart, they would be more likely to be retained in their true place when the sequestrum was removed.

Mr. Coleman said he quite agreed with Mr. Turner, and thought Mr. Fox had best adopt the plan of an internal splint, and keep the two fragments as much in position as possible, and allow the sequestrum with the contained teeth to remain. The objection to removing the sequestrum too early was this—that probably with the sequestrum, portions of the periosteum would be removed, which it was essential to retain for the formation of new bone. He could not agree with Mr. Oakley Coles in his view with regard to syphilitic necrosis. His own experience was that in a case of syphilitic necrosis there was a very small amount of reparative action; in fact, he would have much more encouragement in dealing with phosphoric necrosis than with syphilitic.

Mr. Oakley Coles said he had alluded to the reparative action of the fibrous tissue, rather than to the bone.

Mr. Woodhouse said during the last three or four years he had met with two cases of a fourth lower molar. In each case it existed in the mouth of a lady on the left side of the lower jaw. The first was about four years ago, and had he not been out of health at the time he should then have brought it before the Society. That evening a paper was to be read on peculiarities of the wisdom teeth, and he thought it a good opportunity for bringing it forward. The history of the case was somewhat as follows:—The lady was in India; she suffered considerable pain in the jaw. She consulted medical men about it, and found that they were very much at sea as to the cause. At last inflammation set in, suppuration followed, which relieved itself by a sinus at the angle of the jaw. From this pus flowed to such an extent that she was obliged to keep a pad over the opening, and had great difficulty in going into society at all. After two years she was advised by her medical friends

to come to England, to consult Sir William Ferguson. She did so, and he was a little puzzled by the case. He asked her what dentist she had consulted before going to India, and on mentioning him (Mr. Woodhouse), Sir William Ferguson brought her to him. He examined her mouth very carefully, and found that she had lost no lower teeth. The lower wisdom-tooth on the side of the abscess was apparently perfectly healthy, and the only thing that he could at all detect was a slight blackness on the enamel at the back of the tooth. He probed down very carefully ; everything seemed healthy and in a normal condition, but as it was in the locality of the disease, Sir William agreed with him that it would be better to remove the tooth, as, at all events, it might enable them to ascertain what was amiss. He removed the tooth, which had three fangs. The posterior fang recurred somewhat, and broke in coming out. He immediately probed for it, and then found that there was an opening to a cavity behind the wisdom-tooth in the body of the jaw. He passed his probe carefully into the opening, and distinctly traced the crown of a tooth. He said nothing to Sir William at the time, but took a very fine pair of stump forceps, passed them carefully into the cavity, and took hold of the crown of the tooth, and without the least difficulty, for it had not the slightest hold on the jaw, removed the tooth. Finding then that there was such an extensive cavity in which the supernumerary tooth had been placed bathed in pus, he thought it best not to remove the remaining portion of the true wisdom-tooth, and left it there. He saw the lady a year afterwards, and she had had no irritation whatever from the remaining root, and her daughter, who is at present under his treatment, tells him that her mother has suffered nothing from it. Subsequently, when the mother was going back to India, she asked him to examine the teeth in the other side. He did so, and found not the slightest trace of anything to indicate the presence of a fourth molar there, so he advised her to leave matters as they were, as she suffered no pain whatever. Within a week of the removal of the tooth the discharge entirely ceased, and had never returned. He had preserved the two teeth. The true wisdom-tooth had a little portion of the posterior root broken, and the fourth wisdom-tooth might pass for an ordinary wisdom-tooth in every respect, the only thing remarkable about it being the absorption of a portion of the surface of the root from the diseased action which resulted from the formation of pus. Curiously enough, a year afterwards another case of the existence of a fourth molar in a lady's mouth was brought before him. The tooth had made its appearance just through

the gum ; it was healthy and going on well, and he recommended her to leave matters as they were. Last week she came to him again, and he examined her mouth, and took an impression of it. He found that the supplementary wisdom-tooth was then decayed, as was also the true wisdom-tooth. He therefore advised her at once to have the supplementary tooth taken out, thinking that it would be a very small affair ; but, to his surprise, it did not prove so, for the tooth was a well formed one. The anterior portion of its grinding surface was under the neck of the wisdom-tooth, and he had considerable difficulty in removing it : this was in a measure owing to the inability of his patient to open her mouth sufficiently wide to admit the forceps. The corresponding true wisdom-tooth on the right side was excessively large, and evidently composed of two germs merged into one. In the upper jaw the teeth had their normal form. He wished to present the teeth of both cases, and the impressions of the latter, to the Museum.

Mr. Mummery mentioned a very interesting case which had been brought under his son's notice about a year ago. The patient was a civil engineer who had been employed in Brazil, and had suffered considerably for about two years with occasional swelling on the right side of the lower jaw. The doctors there said it had nothing to do with his teeth, although he himself supposed it had. After a great deal of suffering he came home, and during the voyage he took a severe cold, which ended in suppuration at the angle of the lower jaw. The suffering became much more intense until it was relieved by a spontaneous opening, discharging pus, just below the angle of the jaw. Another opening shortly afterwards appeared just below the first, the upper one partially healing. On arriving in England he saw Mr. Howard Mummery, and he was then in the following condition :—There was considerable stiffness in the jaw, which could only be separated to a very slight extent. The gum was very inflamed and thickened behind the second molar, and free lancing with excision of a portion of the gum gave great relief. Three fistulous openings existed on the neck—one just below the angle, another about an inch above the calvicle, and an intermediate one which had nearly closed. These were discharging a thin pus. A probe introduced in the upper opening passed upwards and backwards in the direction of the lower wisdom-tooth, which, after lancing, could just be detected opening forwards and inwards. Although relieved from actual pain, as the patient was returning to South America, and the openings had not closed, it was deemed advisable to extract the tooth, and that was effected with great difficulty un-

der chloroform, the alveolar wall being unusually strong, and the tooth lying very deeply. The extraction was at last accomplished with a pair of very strong double-bladed bayonet stump forceps. The tooth proved to be a large one, and of normal form. The patient was seen a fortnight after, when the fistulous openings had entirely closed, and he was quite free from pain.

The President asked Mr. Woodhouse how he extracted the tooth in the case he had mentioned.

Mr. Woodhouse said he first tried a small pair of bent forceps with fine narrow blades, but the jaw had so little power of opening that he could not move the forceps. He then tried an elevator, but could not move the tooth at all. Next he tried a pair of bayonet forceps, and with them gave it a little motion, but could not raise it. He then took a pair of bent forceps similar to those he had first used, but which had been broken and re-arranged, and were very short in the blade; they were just long enough to go over the true wisdom-tooth, and to pass down to the neck of the supplementary tooth, and he was thereby enabled to extract it after rotating it a little.

CANDY.

By E. CUTTER, M.D.

So much has been written about the relations of candy to health, and particularly to diseased teeth, that it would seem presumptuous to add even a word. But supposing the question cannot be settled at once, there are some facts about candy, or sugar rather, which I have not seen mentioned in connection with the philippics against candy, or the arguments in its favor. As a *food* it is a failure. The chemist tells us that the composition of cane sugar is $C_{12}H_{22}O_{11}$. The human body has some fourteen elements. How can three elements make fourteen? Dogs fed on sugar died in forty days. Their eyes ulcerated and came out. Dogs fed on nothing lived just as long. (Kirkes and Paget's Physiology.) The system has a natural loathing for food containing nothing but sugar. We pass, then, to the occasional use of sugar. Does it affect the condition of the organs of the body? Several years ago Dr. S. Weir Mitchell, of Philadelphia, proved that he could produce cataract of both eyes in half an hour by simply injecting a tea-spoonful of a saturated solution of sugar beneath the skin of a

frog or Guinea-pig. Dr. B. W. Richardson, of London, has confirmed this, and these results are received by the medical profession as satisfactory. Now if a tea-spoonful of sugar solution will make a frog or Guinea-pig totally blind in half an hour, can sugar be regarded as an innocent substance for young and growing persons, especially when they diet so largely upon white flour, which is chiefly composed of starch, whose chemical formula is identical with that of sugar? According to Dr. C. R. Agnew, of New York, out of 1,000 children under 18 years of age, in a large school in his vicinity, 703 were found with defective organs of vision when examined with the ophthalmoscope. Have we a right to infer that sugar and starch diet have anything to do with this large percentage of deficient eyes? The experiments quoted show that sugar does act promptly, quickly and terribly upon the substance of the crystalline lens of lower animals. Can we deny the probability of its action upon the eyes of human beings? Mark, we do not say it does thus act. We simply raise the question. We wish the State Board of Health would have it investigated, as it is a matter germane to their invaluable department of labor.

Now for candy and diseased teeth. Lime and phosphorus form the chief mineral ingredients of teeth. The organic matter (*i. e.*, that like sugar) amounts roughly to about twenty per cent. of the whole tooth. The mineral matter and water make the remaining eighty per cent. In other words, sugar gives the teeth, under the most favorable construction, twenty per cent. of its food only, when it is used as an aliment. But sugar cannot be used as an exclusive aliment, as death would ensue. Used occasionally, when the other food has its normal amount of mineral ingredients, candy, when pure, probably does not harm the teeth. But used frequently, in connection with flour diet, there is no doubt that it will promote the decay of teeth. When organized substances are fed, they must receive all the elements that enter into their composition. Failing to receive these, their vitality is impaired and decay results. Teeth fed with candy do not receive any mineral elements. No phosphorus and no lime are found in candy, but they constitute the main part of teeth. Hence we see that candy and teeth are not interchangeable things, and that candy-eaters must not be surprised if their teeth fail.

When we remember that starch, a colloid, has to become sugar, a crystalloid, before it enters the circulation, what has been said of candy may (excepting the subcutaneous injection experiments) be applied to starch.

Dr. Harriman, one of our Boston dentists, has given the writer the account of several marked cases where the disuse of flour was followed by a restoration of the teeth and an arrest of the decay, thus proving what a diet containing all the elements of the teeth will do for dental health. Those desiring sound teeth will then be in the way of obtaining and keeping them, if they eschew the excessive use of the carbohydrates, starch and sugar-candy.

BODY AND MIND.

Says Mind to Body t'other day,
As on my chin I plied my razor,
Pray tell me, does that glass portray
Your real phiz, or cheat the gazer ?
That youthful face, which bloomed as sleek
As Hebe's, Ganymede's, Apollo's,
Has lost its roses, and your cheek
Is falling into fearful hollows.
The crow's fell foot hath set its sign
Beside that eye which dimly twinkles ;
And look ! what means this ugly line ?
Alas ! my friend, you're getting wrinkles.
Behold ! your cheeks are quite bereft
Of their two laughter-nursing dimples,
And pretty substitutes they've left—
(Between ourselves) a brace of pimples !
The fashions which you used to lead,
So careless are you, or so thrifty,
You most neglect when most you need—
A sad mistake when nearing fifty.
Stop, stop, cries Body, let us pause
Before you reckon more offenses,
Since you yourself may be the cause
Of all these dismal consequences.
The sword, you know, wears out the sheath,
By steam are brazen vessels scattered ;
And when volcanoes rage beneath,
The surface must be torn and shattered.

Have not your passions, hopes and fears,
Their tegument of clay outwearing,
Done infinitely more than years
To cause the ravage you're declaring?
If you yourself no symptoms show
Of age—no wrinkles of the spirit;
If still for friends your heart can glow,
Your purse be shared with starving merit;
If yet to sordid sins unknown,
No avarice in your breast has started;
If you have not suspicious grown,
Sour, garrulous, or narrow-hearted;
You still are young, and o'er my face
(Howe'er its features may be shaded)
Shall throw the sunshine of your grace,
And keep the moral part unfaded.
Expression is the face's soul,
The head and heart's joint emanation;
Insensible to Time's control,
Free from the Body's devastation.

FIFTH DISTRICT DENTAL SOCIETY.

Syracuse, N. Y., May 16th, 1876.

The eighth annual meeting of the Fifth District Dental Society will be held at Rome, N. Y., June 13th, commencing at 2 o'clock, P. M., and continue in session through that and the following day.

The regular order of business will consist of: Report of Standing and Special Committees; President's Address; Reading of Papers and Discussion of the Topics herein contained; Miscellaneous Business and Election of Officers, including two delegates to the State Society for four years each.

The Board of Censors will hold a *side* session some time during the meeting, for the consideration of such business as may come before them.

Applications for membership should be made either to the President, Secretary or Board of Censors.

The following topics are suggested by the Committee on Business.

- 1st. What is the Best Filling for Deciduous Teeth ?
- 2d. Anæsthetics in Dental Practice. To what Extent are we Justified in Using Them ?
- 3d. Treatment of Irregularities. The best Modes of Appliances.
- 4th. Pivot Teeth.
- 5th. Celluloid versus Rubber.
- 6th. Our Duties to Patients.
- 7th. Contour Fillings.
- 8th. Incidents of Office Practice.

All papers prepared to meet the above topics will be read to open the discussion.

Arrangements have been made with the proprietor of Stanwix Hall to furnish accommodations to members and others in attendance at reduced rates. The parlors will be used for the meeting.

Transactions of the Dental Society of the State of New York for 1873 and 1874 will be on sale at fifty cents per volume.

Members so disposed will please come prepared to give the early history of Dentistry in the various counties comprising the Fifth Judicial District. Items of early dental statistics may therefore be reported, as it may go far toward making complete a Centennial Volume of Dentistry, which is now in process of formation. The writers are begging for material. It is perhaps within your means to furnish some.

It is earnestly hoped that there will be a large attendance, as it is now believed this will be one of the most interesting meetings promised to this Society.

A. S. ROBERTS, *President*,

F. D. NELLIS, *Secretary*.

CHILIAN COMPLIMENT TO A PHILADELPHIA MANUFACTURER.

The authorities of the Chilian International Exhibition at Santiago, have awarded to H. D. Justi, of Philadelphia, a first-class medal and diploma, for his collection of artificial teeth exhibited there in 1875. Medal and diploma are now in his possession.

QUERY.—I have put in an upper set of teeth for a gentleman, who complains of a burning sensation in the roof of the mouth. So unpleasant is it, that he is compelled to loosen the plate frequently, to let his mouth cool. What is the cause and remedy? H. M. S.

NOTES.

Primitive Dentists.

(SEE FRONTISPIECE.)

Translated from "*Frank Leslie's Illustrated Zeitung*," by B. HESS, D.D.S.

It is a well-known fact that Dentistry has kept pace in progress with other professions; instead of the primitive tooth-puller it has produced the present dental surgeon.

Dentistry is of good ripe old age; in Egypt there existed a separate caste of Dentists, of whose scientific attainments we have no information; later among the Greeks some progress had already taken place, and dental operations were performed in a rational manner with suitable instruments, as stated in the writings of Hippocrates. Among the old Romans decayed teeth were filled and plugged, and extracting was frequently resorted to.

It is doubtful if there was toothache in paradise, but it may very likely have made its first appearance soon after the "first sin;" and man, civilized or uncivilized, has ever since been occasionally subject to it; even the medicine man of the prairie is applied to for a cure of it.

How this cure is sometimes effected is shown in a frightful manner by our illustration, which represents a relative scene in Persia.

An American traveler, who was an eye witness, gives the following explanation:

The patient afflicted with toothache is laid flat on the ground. Two of his friends try to produce his quietness in the most effectual manner possible, while the operator, who is generally a blacksmith, presses the head of his victim between his knees, with his left hand inserts an iron bar between the jaws to prevent them from being closed, and with his right

hand, by means of a powerful but very simple instrument, he removes the tooth.

Should the patient find any relief by screaming, he is at liberty to do so.

Gelseminum Sempervirens in Facial Neuralgia.

Dr. Spencer Thomson calls special attention (*Lancet*, Dec., 1875) to the value of tincture of gelseminum for the relief of neuralgic pain. According to his experience, the remedial power of gelseminum "seems confined to those branches of the trifacial nerve supplying the upper and lower jaws—more particularly the latter, and more especially when in either jaw the pain is most directly referred to the teeth or alveoli; indeed, he can scarcely recall an instance of the above in which relief was not speedily and thoroughly given." Dr. Thomson now almost invariably prescribes for an adult twenty minims of the tincture as a first dose, to be repeated any time after an hour and a half, if relief is not given. He has rarely had to order a third dose in any of his 40 cases, and he has never found any inconvenience result from the dose. In one instance, a gentleman unadvisedly took thirty minims of the tincture at once, and immediately afterwards went out driving; he told Dr. T. that he experienced for an hour or two some uncertainty of vision when guiding his horse. A severe attack of neuralgia of the jaw was, however, cured by the one dose, and did not return. —*Practitioner*, Jan., 1876.

Dentists who have recently moved will confer a favor, and put themselves in the way of receiving dental information, by sending their new address to JOHNSTON Bros., 812 Broadway.

Medicated Ice.

Dr. Edward Martin, in a recent letter to the *Lancet*, advises the use of Medicated Ice as a simple and convenient means of topical medication, in the treatment of Scarlatinal affections of the throat in young children. In which connection he recommends the following formulæ:

- No. 1.—Sulphurous acid.... $\frac{1}{2}$ drachm.
 Water..... $7\frac{1}{2}$ drachms.
 Mix and freeze.
- No. 2.—Chlorate of Potass... 7 scruples.
 Water..... 1 ounce. .
 Dissolve and freeze.
- No. 3.—Sol. Chlorinated Soda, $\frac{1}{2}$ drachm.
 Water..... 1 ounce.
 Mix and freeze.

The solutions are easily frozen in a test tube immersed in a mixture of pounded ice and salt; when quite solid, a momentary dip of the tube into hot water allows the medicated cylinder to be easily turned out.

 California State Dental Association.

We take pleasure in publishing the following circular letter of the President of this Association, which is addressed to practitioners of that State.—ED.

PRESIDENT'S OFFICE, }
 Oakland, Cal., May 5th, 1876. }

DEAR SIR: In accordance with the custom of my predecessors, I hereby announce the Seventh Annual Session of our Association, which will convene in San Francisco, Tuesday, June 13th, at 10 o'clock, A. M., and will continue four days.

A most cordial invitation is extended to every worthy member of the Profession to be present on that occasion, and all so desiring, if possessing the necessary qualifications, will be as cordially admitted into active membership.

Our very liberal constitution only requires you to have been in practice three

years, exclusive of your term of pupilage, or the holder of a diploma from a respectable Dental College, and the possessor of a good moral character. Also, that you have your application for membership endorsed by two members of the Association.

Our Code of Dental Ethics, to which all members must subscribe, contains nothing to which any honorable practitioner can object. It originated with the American Dental Association, has been adopted by nearly all the State and local Associations, and approved by all the Dental Colleges.

Our objects are—"The promotion of the highest excellence in the science and art of Dentistry and its collateral branches; the cultivation of closer professional relations and good-fellowship among our members, and collectively, to represent and have cognizance of the common interests of the Dental Profession."

I trust you will consider it your duty, as it is the duty of every honorable practitioner, to aid in the carrying out of said objects, that our chosen profession may enjoy more of the confidence and respect of our fellow-men, and the sooner acquire a rank second to no honored profession of our land. We are living in an age replete with manifestations of the incontrovertible fact that through associate effort all professions throughout the world are being more rapidly elevated to their proper sphere than by any other known means; and, in the near future, those who do not exhibit a "progressive spirit," by acquiring and maintaining an active membership in the Associations of their respective professions, will be called upon by an intelligent and appreciative public to "step down and out," that their places may be filled by those of real and not pretended merit.

Please be kind enough to make a careful and impartial examination into all the facts concerning your qualifications as a practitioner. If, fortunately, they are such as to justly entitle you to rank with

those who have attained the higher eminences in our profession, I trust you will deem it all the more your duty to cheerfully give us the benefit of your professional knowledge, thereby assisting in the ever laudable effort to elevate all to the highest degree of professional excellence. If, unfortunately, you do not possess the requisite qualifications to enable you to do justice to your patients, your profession and yourself, I entreat you, let this Centennial year mark the era of your "departure" for a higher, more exalted sphere of usefulness, with a full determination to maintain in the future a professional standing that will prove you worthy your honorable vocation.

In conclusion, permit me to remind you that "he who loses sight of his profession's character must soon suffer in his own, and that your profession, if worthy your choice, should receive all your energies, without which you cannot expect success."

Very respectfully yours,

H. J. PLOMTEAUX,

Pres. California State Dental Ass'n.

Connecticut Valley Dental Society.

The semi-annual meeting of the Connecticut Valley Dental Society for 1876, will be held in Stedman Hall, No. 3 Pratt St., Hartford, Conn., on Tuesday and Wednesday, June 13th and 14th, commencing at 2 P. M. on Tuesday.

QUESTIONS FOR DISCUSSION.—1. Mechanical Dentistry; 2. Treatment of Exposed Pulp in Deciduous Teeth; 3. Anæsthesia; 4. Fungi—What are its Effects upon the Teeth; 5. Causes of Dental Decay; 6. The Rise and Progress of Dentistry in U. S. A.—Essay by Dr. C. S. Hurlbut; 7. Use and Abuse of the Dental Engine; 8. Miscellaneous Subjects.

The evening session will be devoted to a lecture by Prof. J. E. Garretson, M.D., of Philadelphia. *Subject*: "The Clinical

Signification and Treatment of Tumors of the Mouth, Jaws and Face."

Gentlemen having volunteer essays are requested to notify the Chairman of the Executive Committee, Dr. L. C. Taylor.

A general invitation is cordially extended to all members of the profession to be present at this meeting.

C. T. STOCKWELL, *Secretary*.

Springfield, Mass., April 21, 1876.

OFFICERS OF THE SOCIETY.—President, H. F. Bishop, Worcester, Mass.; 1st Vice-President, H. W. Clapp, Westfield, Mass.; 2d Vice-President, E. M. Goodrich, Westfield, Mass.; Secretary, C. T. Stockwell, Springfield, Mass.; Treasurer, N. Morgan, Springfield, Mass.

EXECUTIVE COMMITTEE.—L. C. Taylor, Hartford, Conn.; J. N. Davenport, Northampton, Mass.; L. Noble, Springfield, Mass.

Southern Dental Association.

The Association commenced business at 9 o'clock A. M.

The following dentists were elected to membership: G. C. Sandusky, W. M. Turner, J. H. Weber, W. L. Dismukes, J. C. Ross, A. F. Clayburn, L. G. Noel, W. C. Shepherd, L. Chisholm, H. E. Beach, Henry W. Morgan.

Montgomery, Ala., was selected as the next place of meeting.

Dr. W. H. Morgan read a paper upon "The Proper Method of Conducting Examinations," and Dr. H. E. Beach upon "The Relative Merits of Materials for Filling the Teeth." The latter paper elicited some warm discussion from Drs. Redman, Noel, Russell, Beach and Freeman.

An election then ensued, with the following result: President, W. G. Redman, Louisville, Ky.; Vice-Presidents, G. C. Sandusky, R. Russell and E. S. Chisholm; Corresponding Secretary, W. L. Dis-

mukes ; Recording Secretary, H. E. Beach ; Treasurer, S. J. Cobb.

Drs. Samuel Rambo, L. C. Chisholm and Arthur Ford were elected as an Executive Committee.

A vote of thanks was tendered United States Marshal Wheat for the use of the Federal Court-room.

The Association then adjourned until the second Tuesday in April, 1877.

New Jersey State Dental Society.

The Sixth Annual Meeting of the New Jersey State Dental Society will convene at Atlantic City the second Tuesday in July, at 10 A. M., and continue in session three days. A cordial invitation to meet with us is extended to the dental profession generally.

CHAS. A. MEEKER,

Secretary, Newark, N. J.

Penal Electricity.

A recent English writer makes the following suggestion : "Now creatures in the likeness of men vent their despicable passions in murderous assaults upon women and children. But science hints at an effectual cure. It is probable that, before many years have passed, electricity, which by some mysterious means enables our nerves to call our muscles into play, which enables us to converse with one another at distances of thousands of miles, which alike plates the teaspoon and illumines the light-house, will be called upon by an enlightened legislature to produce absolutely indescribable torture (unaccompanied by wound or even bruise) thrilling through every fibre of such miscreants."

Acid produced by Plant Growth

If seeds (barley, wheat, or other,) be placed between moist pieces of litmus-paper, the roots stick to the paper, and color it so intensely red that even on the back of the paper their coarse can be traced in red lines on a blue ground. If tincture of litmus be repeatedly added,

the intensity of the red color is increased. M. Cohn thus demonstrated lately the separation of a strong non-volatile acid by the roots.

Fixing Pencil Drawings.

The *English Mechanic* gives the following minute directions for doing this : "Lay the drawing on a sloping board, and pour boiling water gently over it ; this will remove all superfluous particles of lead, and will bring some of the size in the paper to the surface ; boil some isinglass or gum-arabic in water to make a very thin size ; pour it out on a flat dish to cool ; run the drawing through the size, taking care that every part of it is well wetted ; then lay it on a board to dry. The size should be so thin as to feel just a little sticky between the thumb and finger when cool. If too thick it will be seen on the drawing after it is dry. I have tried many ways of fixing drawings, but have never found any equal to this."

A correspondent says : "The best solution to fix drawings is that made with gum tragacanth. 1st, it sizes the paper ; 2d, it fixes the pencil drawing ; 3d, it does not chip when wetted ; 4th, it enables you to continue the drawing afterwards if desired ; and 5th, it is possible to color over it."

Fruit Eating.

When fruit does harm, it is because it is eaten at improper times, in improper quantities, or before it is ripened and fit for the human stomach. A distinguished physician has said that if his patients would make a practice of eating a couple of good oranges before breakfast, from February till June, his practice would be gone. The principal evil is that we do not eat enough of fruit ; that we injure its finer qualities with sugar ; that we drown them with cream. We need the medicinal action of the pure fruit acids in our system, and their cooling, corrective influence.

DENTAL ENGINES.

THE TIDE HAS TURNED !

We have had a longer experience in the manufacture and sale of Dental Engines than any other house, and have been greatly surprised at the popular preference for an engine that we had rejected after careful examination as having grave faults inherent in its plan. So strong has been the current against us that we had almost doubted the correctness of our conclusions ; but at last we find them vindicated, and the profession fast reaching the truth that to do satisfactory work an engine must be completely under control, and the instrument make a steady, and not a chattering cut. We are daily importuned to substitute our Suspension Engine for those of other makers. We append a few recommendations, recently received, of the Suspension Engine.

JOHNSTON BROS.

Augusta, Ga., March 14th, 1876.

SIRS : Your Suspension Engine I regard as perfect in every detail. It works with equal facility in any position. Work impracticable to do by hand can be done with this engine with ease and comfort to the patient. It is entirely out of the way of the patient and operator, and I can work it myself easier and do more work than I could with the Morrison engine with a man to drive it for me.

Yours truly,

E. W. HARKER.

MESSRS. JOHNSTON BROS.

New Haven, Conn., Feb. 19th, 1876.

DEAR SIR : In reply to your letter, I would say I have used the "Suspension Engine" for over a year and like it very much. I think it is superior to any other for carrying the corundum disk.

Yours very truly,

H. S. BASCOM.

MESSRS. JOHNSTON BROS.

New York, Feb., 1876.

DEAR SIR : I have been using your Suspension Dental Engine for many months, and I am free to say that I consider it superior to any engine I ever saw. It is neat, simple and durable in its construction, and nearer perfection in its operations than any engine now in use.

Yours truly,

WM. C. BENNETT.

JOHNSTON BROS.

Augusta, Ga., Feb. 17th, 1876.

DEAR SIR : The Suspension Engine I believe to be superior to all others. I am delighted with the one I purchased a year ago. It presents numerous advantages, notably, its extensive and easy range of motion, and its convenience

of application. When properly placed, it is never in the way, requires no moving into or out of position, and is always ready to hand for immediate use. If suspended two inches to the left and four to the rear of the patient and propelled by the left foot, there are no cords to incommode patient or operator, no arms or cables to interfere with bracket or cabinet, and no hand-piece to be painfully reached for or carefully laid aside. There is the hand-piece just above the patient's head, easily reached, and with no danger that in being taken hold of or released, the tool will fall out or the disk be broken by striking against chair or standard. The range of motion is greater than necessity demands. I do not hesitate to say that first-class dentistry can only be done with the aid of an engine, and best, I believe, with the Elliott Suspension Engine.

Very respectfully, etc.,

WM. C. WARDLAW.

JOHNSTON BROS.:

557 Orange St., Newark, N. J., Feb. 16th, 1876.

Yours at hand: In answer would say that the Elliott Suspension Engine is a great improvement on, and has many advantages over any engine in the market at present. The one virtue of using the hand-piece at any angle is to my mind the greatest advantage secured by this little help to the dentist. The hand-piece, too, is just the thing; I used one of another make the other day, but did not think it nearly as good. As to its general utility, it certainly is my choice of them all, and I would not be without one for three times the amount it cost.

Yours, etc.,

J. C. HANKS.

JOHNSTON BROS.

Feb. 16th, 1876.

GENTLEMEN: After having used your Suspension Engine a year, I have no hesitation in stating that it has *all* the advantages you claim for it. Among the most prominent are, first, its perfectly free movement, second, the lightness with which it runs, and third, its durability.

Yours, etc.,

ROBT. B. CANTRELL.

P. S.—This engine *costs less to run* than any other I have ever had. In fact, it can be run full power *a whole day* on two glasses of lager.

Wilkesbarre, Pa., Feb. 25th, 1876.

The Elliott Suspension Engine, which I have been using the past year, has worked satisfactorily to me in every way. I find in it a combination of all requisite power with a perfect range of movement; and these qualities, added to the facility with which the hand-piece is thrown out of the way and so readily reached, render it, in my opinion, all that can be desired.

W. C. STARBUCK, D.D.S.

MESSRS. JOHNSTON BROS.:

Manchester, Mich., March 13th, 1876.

I have now been using the Suspension Engine two years, after having used the Morrison over two years. I much prefer the former to the latter. The suspension just fills the bill. It is always in running order, and does its work well and quickly, is always in reach and at the same time out of the way. It is light in the hand, is easily controlled, cuts when and where the operator directs without cutting away too much "tooth substance," as some fear is too often done with engines (that is, if the operator has intelligence and skill enough to be competent to perform his operation well, if his head does not *whirl*.) I would not dispense with it for much more than cost. I believe the operator's skill can be made to operate through so perfectly an adapted machine as well as through the hand, in directing any lesser instrument, and more satisfactory.

Very truly yours,

E. HUNTER.

MESSRS. JOHNSTON BROS.

Newburgh, Feb. 17th, 1876.

GENTLEMEN : I would like to say something about the Suspension Engine, invented by my friend Dr. W. S. Elliott of Goshen. I have used it one year, and to me its great features are smoothness of motion, universality of application, so easily taking its flight upward when no longer needed, and so reachably and unresistingly coming down when called again into action, performing all its duties with such quietness of deportment that it readily becomes a favorite with patients as well as operators. I have ceased to look for anything better in any engine.

Very truly yours,

L. S. STRAW.

MESSRS. JOHNSTON BROS.

Bridgeport, Feb. 26th, 1876.

GENTLEMEN : I have had your Suspension Engine in constant use for the past nine months, and in reply to your inquiry desire to say that it has given perfect satisfaction ; and in the freedom of motion and steadiness of the hand-piece is superior to any I have used or seen.

Yours respectfully,

W. L. FERRIS, D.D.S.

MESSRS. JOHNSTON BROS.

Oneonta, Feb. 24th, 1876.

GENTLEMEN : It gives me pleasure to say a word in commendation of your Suspension Engine. I have used the Morrison, the original Suspension (as made by Elliott), and am now using S. S. White's Engine with latest improvements, and can say with all sincerity I think your Suspension Engine the best Engine now in use. It has ample strength, works very easily and is entirely noiseless, the last named quality being very desirable, as the noise of all engines (except the Suspension) is very aggravating to both patient and operator. I am with great respect, yours truly,

L. E. IRELAND.

MESSRS. JOHNSTON BROS. :

Hagerstown, Md., March 7th, 1876.

The Suspension Engine, now in use one and a half years, daily gives me entire satisfaction, its adaptability is a quality worthy of notice, especially for the patients. Have owned and used two others, much prefer the Suspension.

Respectfully,

J. E. SWALLOW.

MESSRS. JOHNSTON BROS.

Peoria, Illinois.

GENTLEMEN : After over one year of constant use of the Suspension Dental Engine, I can say with confidence that I believe it to be the most complete engine for dental purposes yet offered to the profession. Much superior to any other in its adaptability to all patients ; the steadiness of motion it maintains in all possible positions, the ease and freedom with which the operator can run it from morning till night, can not be equaled by any other. I can stand in front of my patient, which I find a very great advantage, as I can get close to my work, which you cannot do with every engine as the arm prevents. With the constant use my engine has had, the wear is scarcely perceptible.

Yours very respectfully,

W. T. SMITH.

MESSRS. JOHNSTON BROS.

Macon, Ga., Feb. 24th, 1876.

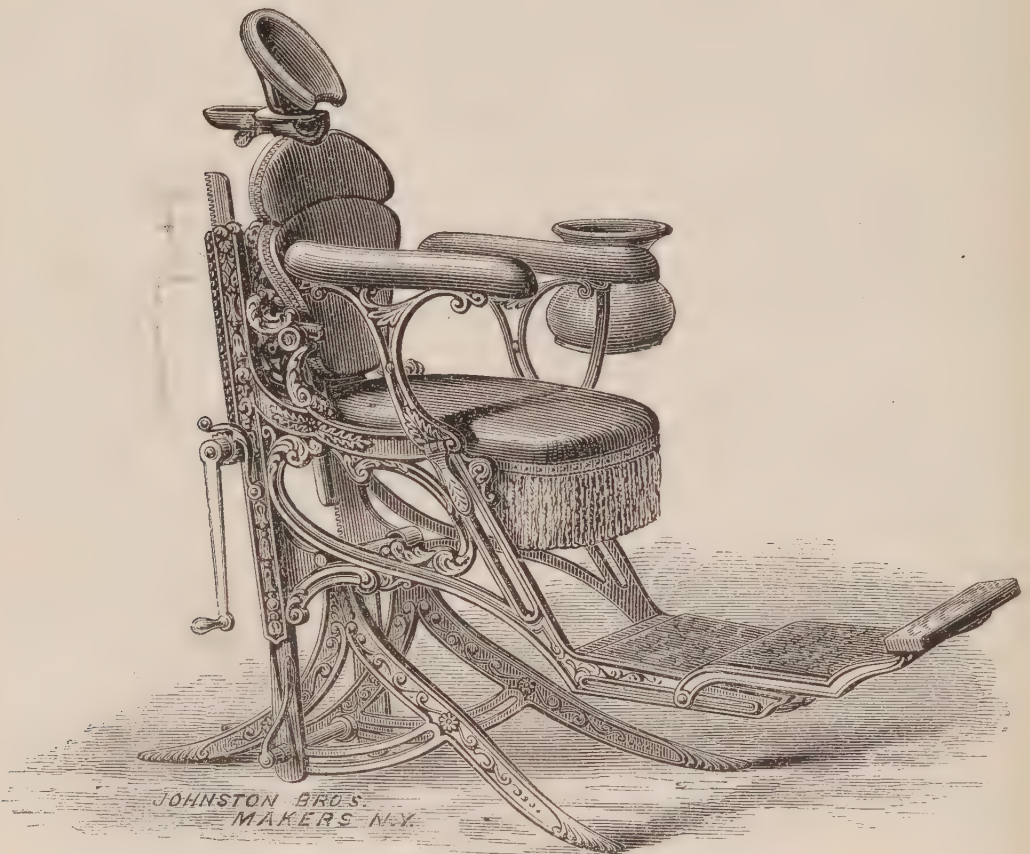
We cheerfully state that your Suspension, after a good fair trial, was found to be quite the thing ; noiseless, out of the way when not being used, and when used quite convenient, effective. To appreciate it and its value one must have it and know how to use it, which is easily learned. We saw one in constant use in Atlanta in the office of Drs. Billipp & Smith. They were very much pleased with it and found no faults in its arrangements or service. We have two engines on hand or would have purchased one of your engines.

Very respectfully,

B. P. & W. R. HOLMES.

For Cut, see Burr Catalogue at end of the Advertising Pages.

THE MORRISON DENTAL CHAIR.



**Price \$150.00, or, with Castors, \$160.00. Boxing, \$5.00.
Spittoon Attachment, \$8.00.
WITH JOHNSTON'S NEW HEAD-REST, \$8.00 EXTRA.**

It possesses great superiority over any chair before offered to the profession, and is at the same time less expensive than any other first-class chair. Some of its points of superiority we here enumerate :

- 1st. All the advantages of any low-based chair, and also of any high-based chair, are here secured in a single chair. In it the patient can be placed lower than in the lowest-based chair made, or higher than in any other of which we have knowledge. At its lowest position the seat is fifteen inches, and at its highest position forty-two inches above the floor.
- 2d. The operator using the Morrison Chair can either stand or sit at his work, as he may choose, working with equal convenience in either position.
- 3d. It has been a very general complaint that dental chairs are too wide at the back, so holding the operator away from his work. Here this difficulty is overcome. The chair is narrow at the back, so that the operator need not stretch to reach the patient, but *can lower either arm of the chair out of the way* and so be as near the patient as he may choose.
- 4th. It can be changed from its lowest to its highest position in seven seconds—a celerity impossible in any chair raised by a screw.

- 5th. It can be very readily and perfectly adapted to operations on children of any age
First. Because in it the child can be raised as high as needed for the tallest operator.
Second. It provides a comfortable back and head rest, exactly as for grown persons.
Third. The footstool can be lengthened or shortened, to suit children of any size.
- 6th. The back of the chair can be lengthened or shortened rapidly and at will.
- 7th. The lower part of the back can be thrown forward to support the small of the patient's back.
- 8th. The chair, when adjusted to any position, is firm or steady wherever placed, and this is *especially true of the head-rest.*
- 9th. It occupies less room than any other operating chair.
- 10th. Although the footstool, when at its extreme length, is much longer than any other made, yet a person of ordinary weight can stand on its extremity without tipping the chair.

JOHNSTON BROTHERS,

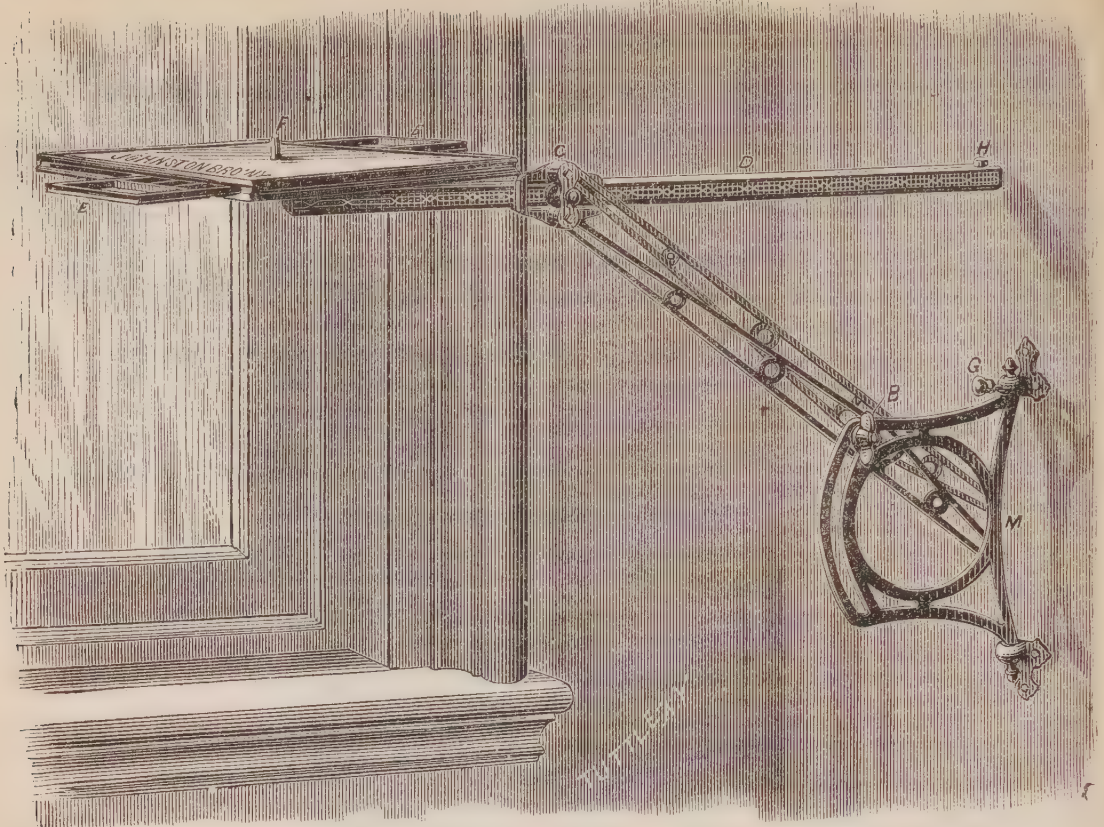
812 BROADWAY, N. Y.

We venture to append the names of some of those who have used the Morrison Chair. As the list of purchasers is too long for publication here, we name a few only from each section of the country.

O. A. JARVIS, <i>New York.</i>	JAMES McMANUS, <i>Hartford, Conn.</i>
D. H. GOODWILLIE, <i>New York.</i>	R. F. BORDEN, <i>Red Bank, N. J.</i>
O. A. HOUGHTON, <i>Brooklyn, N. Y.</i>	F. A. SHAILER, <i>Essex, Conn.</i>
A. C. HAWES, <i>New York.</i>	WILLIAM DUTCH, <i>San Francisco, Cal.</i>
W. B. CHAMBERS, <i>Newark, O.</i>	R. B. DONALDSON, <i>Washington, D. C.</i>
C. B. ANSART, <i>Oil City, Pa.</i>	B. F. COY, <i>Baltimore, Md.</i>
M. H. WEBB, <i>Lancaster, Pa.</i>	C. P. CLIFFORD, <i>Lowell, Mass.</i>
T. W. FRENCH, <i>Gt. Barrington, Mass.</i>	S. H. HINKEL, <i>Stannton, Va.</i>
E. H. EVANS, <i>Rockland, Me.</i>	E. G. WHEELER, <i>Mobile, Ala.</i>
E. O. SMITH, <i>Salem, Oregon.</i>	J. A. DAVIS, <i>Chicago, Ill.</i>
W. F. LEWIS, <i>Winona, Minn.</i>	C. B. ERICHSON, <i>New Britain, Conn.</i>
T. J. McMILLAIN, <i>Paris, Ky.</i>	H. BENTLEY, <i>West Meriden, Conn.</i>
G. W. TINDALL, <i>Kansas City, Mo.</i>	H. H. SAYLES, <i>Elmira, N. Y.</i>
A. W. KINGSLEY, <i>Elizabeth, N. J.</i>	PRESTON DAY, <i>Warren, R. I.</i>
J. N. SCRANTON, <i>Bennington, Vt.</i>	E. T. DARBY, <i>Philadelphia, Pa.</i>
O. A. GLIDDEN, <i>New York.</i>	G. W. TRIPP, <i>Auburn, N. Y.</i>

H. B. SANDS, M.D., Surgeon, *New York*

MORRISON DENTAL BRACKET



PRICES.

With Black Walnut Table, 12 inches square.....	\$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather.....	40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket.....	17.00.
Boxing.....	\$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these :

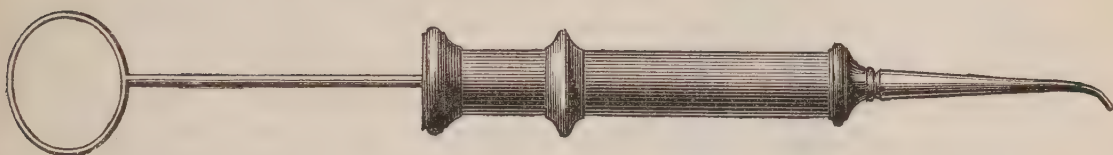
- 1st. It combines a greater variety of range and movement than any other.
- 2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
- 3d. It provides a clean receptacle for foil and instruments.
- 4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
- 5th. Its drawers extend through the table and can be opened from either side.
- 6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

SYRINGE.



This syringe, of metal, nickel-plated, is represented half-size. It is provided with a spring, a suggestion from Dr. A. H. Brockway, so that if after use it is placed in water its piston rises and it fills itself with water, and is so constantly ready for use.

The points, straight and curved, are removable at will.

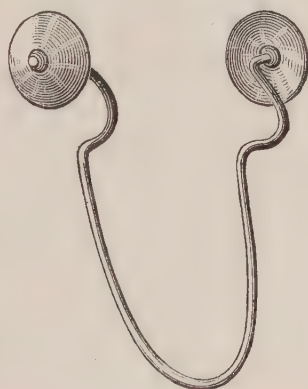
PRICES.

With one point, curved.....	\$2 25
With two points, one straight and one curved.	2 50

JOHNSTON BROTHERS,

812 Broadway, New York.

Elliott's Cheek Distender.



Cut is $\frac{1}{4}$ size.

This convenient device, as its name implies, is designed to distend the cheeks of a patient during operations on the teeth.

Its bow of spring wire, and the cheek pieces are polished and nickel plated. It serves, in connection with its principal use, to reflect light on the teeth. As the spring is not stiff it is worn with very slight inconvenience. *This is proving extremely popular.* Price \$1.00.

JOHNSTON BROS,

812 Broadway, N. Y.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($\text{NO}^2 + 2\text{O} = \text{NO}^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid Nitrous Oxide*, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether.....	I death to 23,204 administrations.
Chloroform.....	I " 2,723 "
Mixed Chloroform and Ether....	I " 5,588 "
Bi-chloride of Methylene.....	I " 7,000 "
NITROUS OXIDE.....	no Deaths in 75,000 "

Edward R. Squibb, M.D., than whom our country has no more able pharmacist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

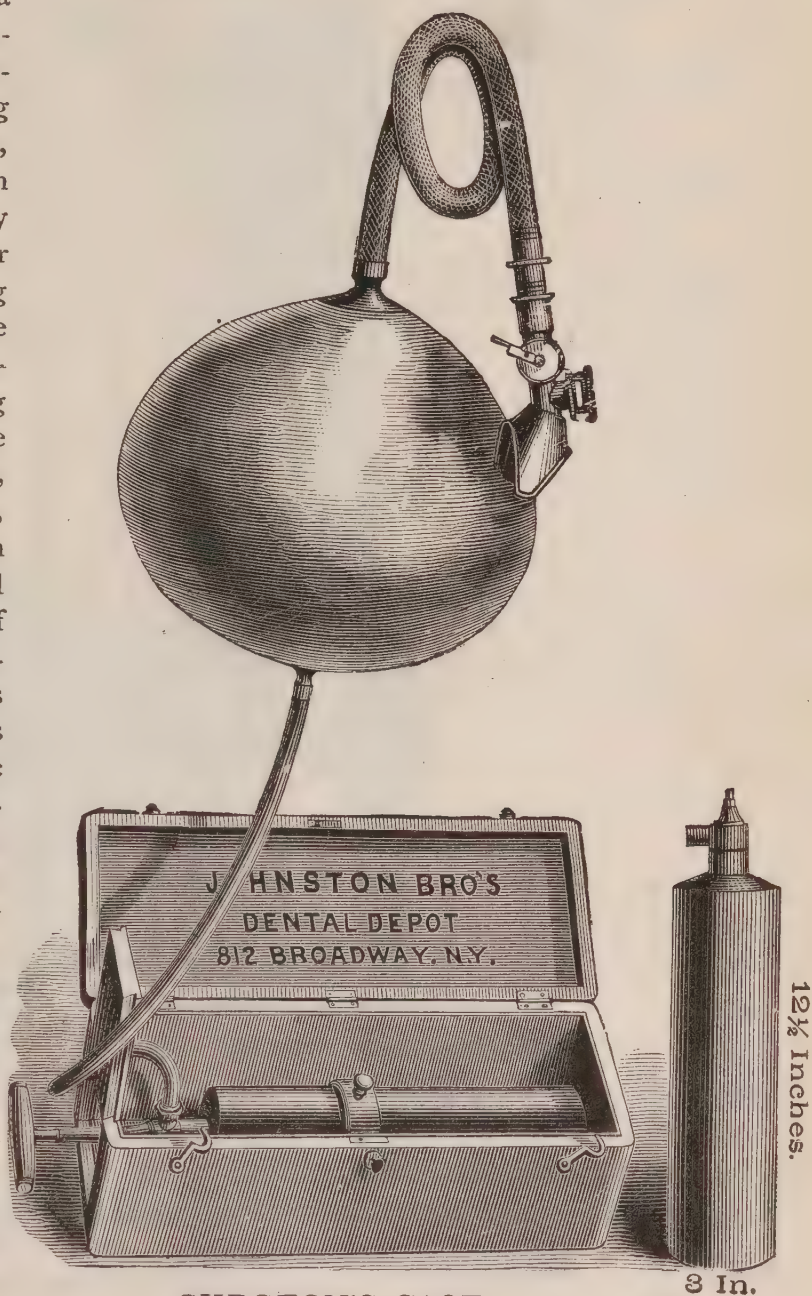
Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

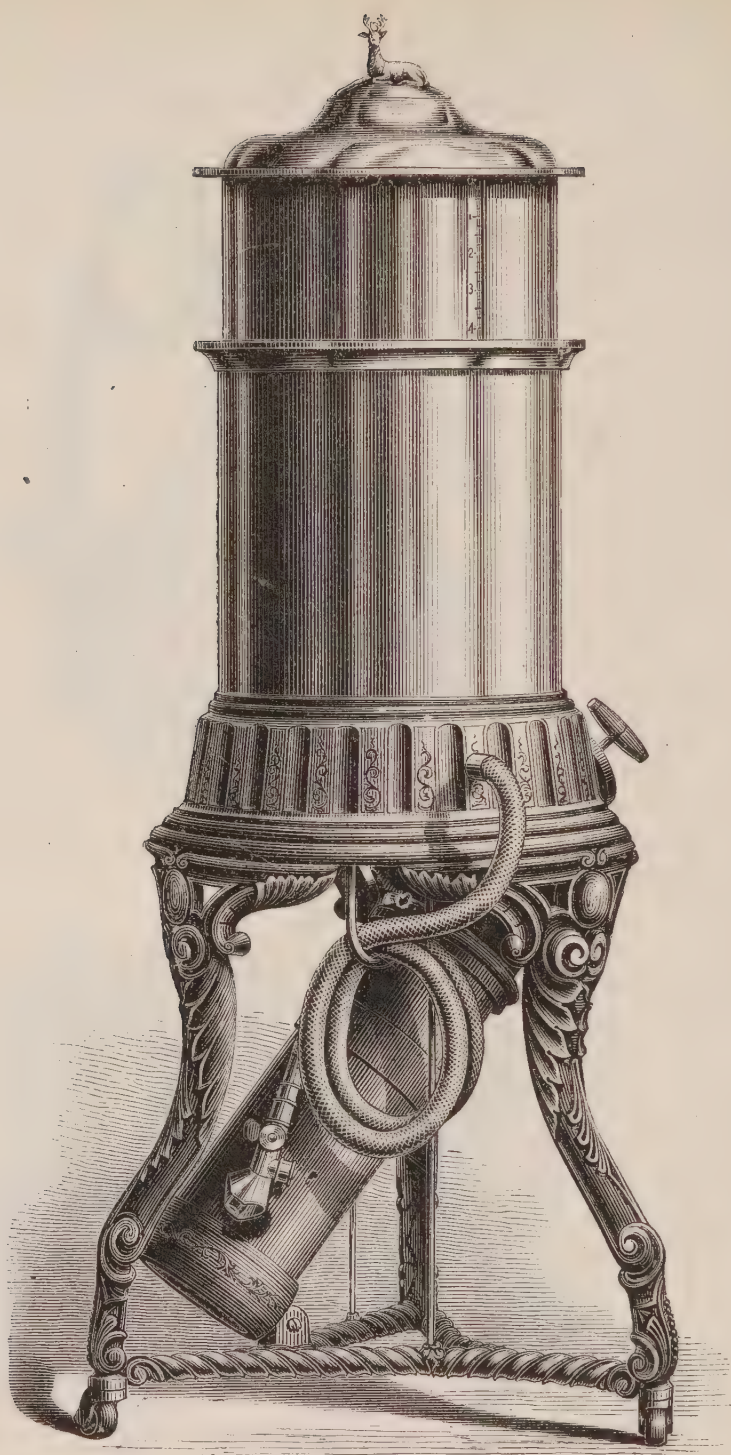
Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers

without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.



NICKEL-PLATED GASOMETER
AND ORNAMENTED STAND
FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas—this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality*.

JOHNSTON BROS., 812 Broadway, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, **the** operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler.....**No. 1**....\$42 00

Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic

Inhaler.....**No. 2**.... 45 00

Boxing either, \$1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas..... 16 00

Refilling Cylinder..... 6 00

Nickel-Plated Gasometer, with ornamented iron stand.....128 00

Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered
Tubing)..... 12 00

1000 Gallon Cylinder..... 36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of $4\frac{1}{2}$ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at $4\frac{1}{2}$ cents..... 45 00

Morocco covered case, with ring and thumb screw, velvet lined..... 12 00

Polished bl'k walnut “ “ “ “ “ “..... 13 00

Of these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity) 5 00

Rubber Bag, with covered inhaler tubing, extra size..... 7 00

Inhaler, latest style, with two way stop cock, adapted to the use of both dentists
and surgeons, with connection..... 9 50

Key, Nickel Plated..... 1 50

Wrench, “..... 50

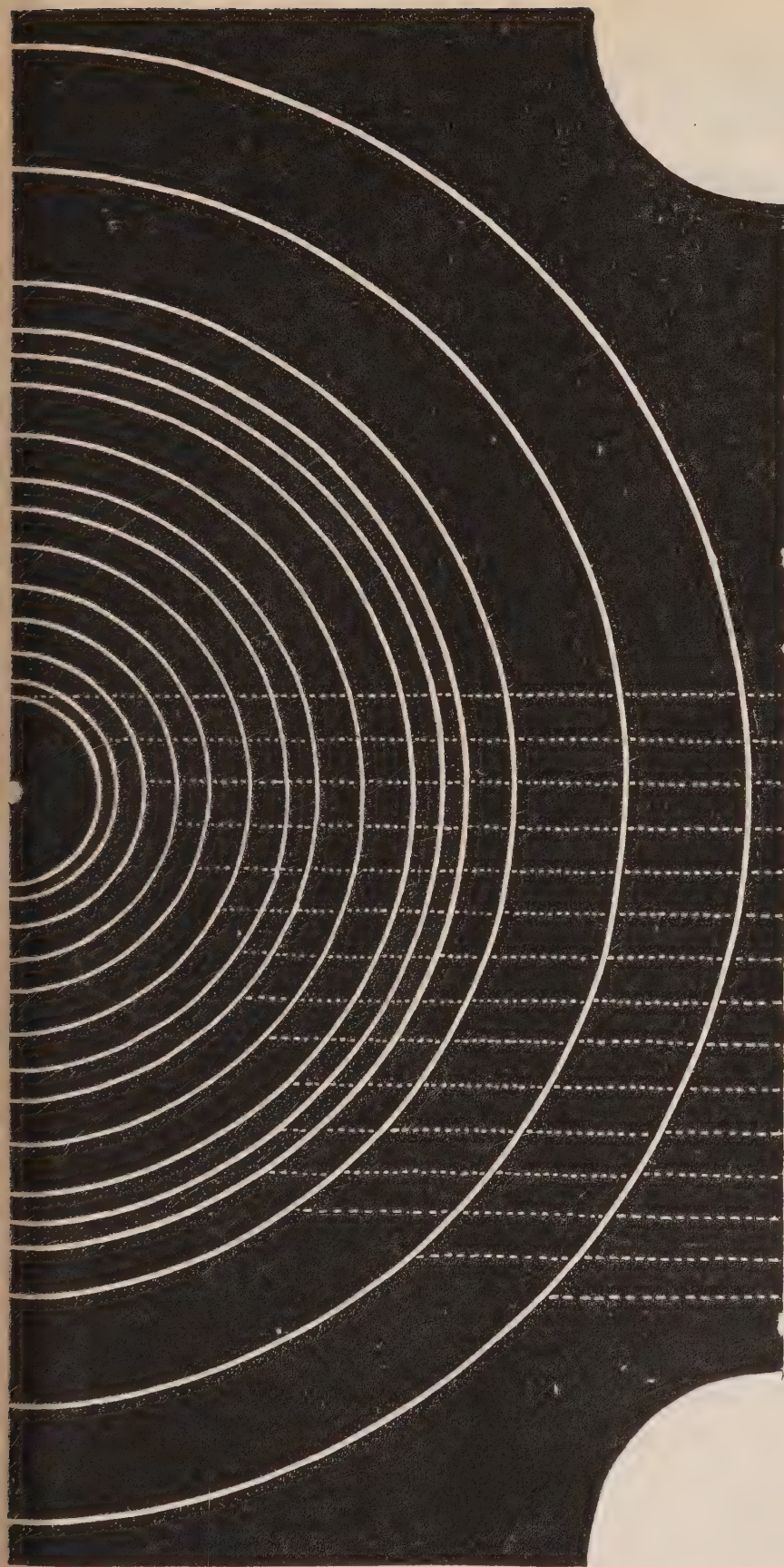
Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag..... 1 50

Covered Inhaler Tubing, per foot..... 50

Plated Connection to fit old style Inhaler..... 1 00

JOHNSTON BROS.,

812 Broadway, N. Y.



THICKNESS.

No.	$\frac{1}{4}$ in.	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.	1 in.
.00	7			
..0	9			
..1	12	18	25	35
..2	16	20	30	40
..3	20	30	45	60
..4	25	40	60	80
..5	30	60	90	1.20
..6	40	75	1.15	1.50
..6 $\frac{1}{2}$	50	80	1.30	1.80
..7	60	1.00	1.50	2.00
..7 $\frac{1}{4}$	75	1.25	2.00	3.00
..7 $\frac{1}{2}$	90	1.40	2.40	3.40
..8	1.00	1.50	2.50	3.50
..9	2.00	3.00	4.00	5.50
.10	3.00	4.00	6.00	8.00

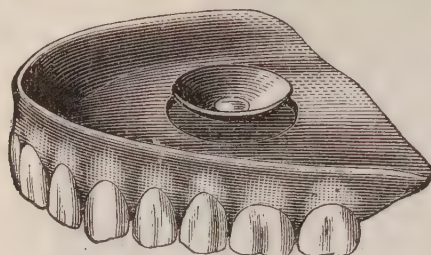
CONUNDRUM WHEELS.

These wheels we believe are unsurpassed in quality, and may be depended upon for uniformity of composition.

Orders from the trade solicited.

JOHNSTON BROS.,
812 Broadway, New York.

NEW PATENT ATMOSPHERIC DISK.



FOR HOLDING ARTIFICIAL TEETH FIRMLY IN PLACE

In Eating, Talking, Laughing, Singing, Coughing or Sneezing.

The undersigned offers to the dental profession this new and valuable device for retaining base plates securely in the mouth. Its utility has been demonstrated in over five hundred cases in my own practice. I believe it must come into general use, as no patient will dispense with it after a trial of its advantages. The Patent bears date of January 24, 1871, with seventeen years to run. Office, Town, County, or State rights for sale. Those desiring to test the disks practically before purchasing, can secure the necessary materials, ready for use, for six cases, with full instructions, by sending P. O. Money Order for three dollars.

Office rights for the full term.....\$40 00
 “ “ “ one year 10 00

Those purchasing rights for one year will be given rights for the balance of the term for \$30 more, if they choose to continue after the year has expired.

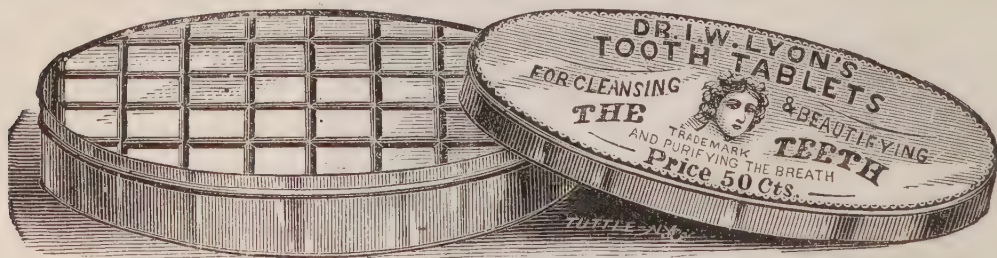
N. B. The Relyea Retainer and all other styles of disks are infringements of our patent; we shall certainly protect our rights.

Address

DR. QUINCY A. SCOTT,

Lock Box 1,015, Pittsburgh, Pa.

DR. I. W. LYON'S TOOTH TABLETS.



NOTICE-CHANGE OF BOX.

I have dispensed with the pasteboard box formerly used in putting up the TABLETS, in consequence of its liability to breakage, and have substituted a SEAMLESS METALLIC BOX, which is impervious to air and moisture, and may be carried on a journey without danger of breaking, thereby preserving the TABLETS perfectly.

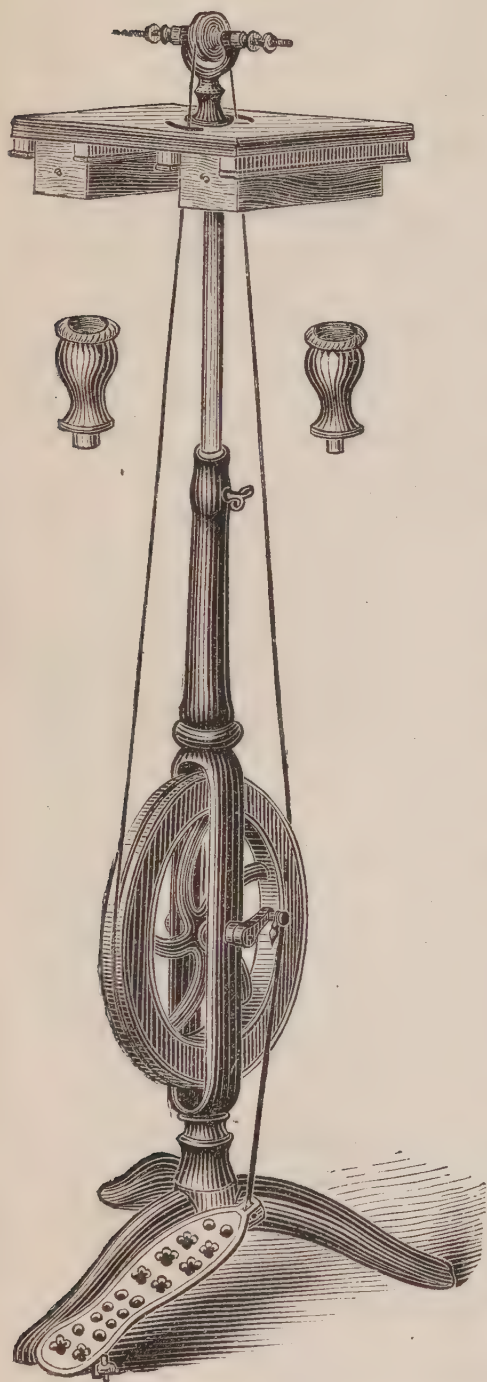
Confident that the change will be duly appreciated by the patrons of LYON'S TOOTH TABLETS, I am, respectfully,

I. W. LYON, D.D.S., Proprietor,

36 Vesey Street, New York.

SOLD BY DRUGGISTS AND DENTISTS GENERALLY, AND AT THE DENTAL DEPOTS.

American Lathe.




This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

Price of Lathe, with two Chucks, - - - \$18 00

“ Chucks, extra, - - - 15

 No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

For Sale by

JOHNSTON BROTHERS,

812 Broadway, New York.

NEW YORK COLLEGE OF DENTISTRY,

1876-77.

FACULTY.

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FRANK ABBOTT, M.D., Professor of Operative Dentistry and Oral Surgery.

ALEX. W. STEIN, M.D., Professor of Histology, Visceral Anatomy and Physiology.

F. LEROY SATTERLEE, M.D., Ph.D., Professor of Chemistry, Materia Medica and Therapeutics.

C. A. MARVIN, D.D.S., Professor of Mechanical Dentistry.

WILLIAM H. ALLEN, Clinical Professor of Operative Dentistry.

JOHN ALLEN, D.D.S., Clinical Professor of Mechanical Dentistry.

JOHN T. METCALF, Clinical Professor of Operative Dentistry.

WM. T. LAROCHE, D.D.S., Clinical Professor of Operative Dentistry.

WM. B. HURD, D.D.S., Clinical Professor of Operative Dentistry.

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D. W. WILLIAMSON, D.D.S., Demonstrator of Operative Dentistry.

A. RUST CUYLER, D.D.S., Demonstrator of Mechanical Dentistry.

C. P. KREIZER, M.D., Assistant to the Professor of Chemistry, Materia Medica and Therapeutics.

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Monday, October 4th, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions...	\$150.00
For the Course of Lectures only.....	100.00
Matriculation	5.00
Graduation Fees.....	30.00

Board may be obtained for from \$6 to \$8 per week.

For further information, address

FRANK ABBOTT, M.D., Dean,
12 West Nineteenth Street, New York.

HARVARD UNIVERSITY.

Dental Department.

BOSTON, MASS. 1875-76.

FACULTY.

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OLIVER W. HOLMES, M.D., Professor of Anatomy.
HENRY J. BIGELOW, M.D., Professor of Surgery and Clinical Surgery.
THOMAS H. CHANDLER, D.M.D., Professor of Mechanical Dentistry.
GEORGE T. MOFFATT, M.D., D.M.D., Professor of Operative Dentistry.
LUTHER D. SHEPARD, D.D.S., Adjunct Professor of Operative Dentistry.
NATHANIEL W. HAWES, Assistant Professor of Operative Dentistry.
EDWARD S. WOOD, M.D., Assistant Professor of Chemistry.
HENRY P. BOWDITCH, M.D., Assistant Professor of Physiology.
WILLIAM H. ROLLINS, D.M.D., Instructor in Dental Pathology.
CHARLES A. BRACKETT, D.M.D., Instructor in Dental Therapeutics.
IRA A. SALMON, D.D.S., University Lecturer on Operative Dentistry.
CHARLES B. PORTER, M.D., Demonstrator of Practical Anatomy.
CHARLES WILSON, D.M.D., Demonstrator in Charge.
GEORGE F. GRANT, D.M.D., Demonstrator of Mechanical Dentistry.

The Ninth year of this School begins on the 28th of September and continues till the last Wednesday in June. The distinction of Summer and Winter sessions being hereafter abolished. It will be divided into two equal terms, with a recess of one week at Christmas. The course of instruction will be progressive, extending over two years, the lectures of one year not being repeated in the next.

The regular examinations will be held in the following order, viz.: At the end of the first year, anatomy, including dissection, physiology and general chemistry. A certificate from the demonstrator of anatomy will be required of each student, that he has satisfactorily dissected the three parts of the body.

At the end of the second year, dental pathology, including a knowledge of gestation and diseases of women so far as they affect the mouth and throat, dental materia medica and therapeutics, oral surgery and surgical pathology, operative and mechanical dentistry. The examinations in operative and mechanical dentistry will include actual operations and the preparation of specimens of mechanical dentistry.

Every candidate must be twenty-one years of age, and of good moral character; he must give evidence of having studied medicine or dentistry three full years; he must have spent at least one continuous year at this school, have presented a satisfactory thesis and have passed all the required examinations.

The University Degree, D.M.D. (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfil the requirements.

Students may be admitted to advanced standing upon passing a satisfactory examination in a majority of the studies already pursued by the class; but no student shall advance with his class or be admitted to advance standing until he has passed such examination.

The work in the operative and mechanical infirmaries will go on throughout the course, but no student shall be permitted to operate at the chair until he has by observation and practice on extracted teeth satisfied the Professor of his fitness.

The faculty recommend young men who propose to take the degree to spend the whole of the required term of three years of study in the school. But those who wish to spend but two of the three years in the school are earnestly advised to pass their first year of study, before entering, under the direction of a *competent* private instructor.

Unsurpassed facilities for operative and mechanical practice are furnished by the infirmary of the Massachusetts General Hospital which is open throughout the year.

F E E S .

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is \$200; for the second year, \$150; for any subsequent year, \$50.

For further information address,

THOS. H. CHANDLER, Dean,

222 Tremont Street, Boston, Mass.

PHILADELPHIA DENTAL COLLEGE,

Nos. 108 and 110 N. Tenth Street, above Arch.

FOURTEENTH ANNUAL SESSION, '76-'77.



FACULTY.

J. H. McQUILLEN, M.D., D.D.S., Professor of Physiology.
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D. D. SMITH, D.D.S., Professor of Mechanical Dentistry and Metallurgy.
S. B. HOWELL, M.D., Professor of Chemistry and Materia Medica.
T. C. STELLWAGEN, M.D., D.D.S., Prof. of Dental Pathology and Op. Dentistry.
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THE DISPENSARY and Laboratory open all the year.

Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June. *Fall Preliminary Lectures*, commencing Monday, September 4th, will continue daily until November. Like the Spring Course, their object will be to anticipate subjects presented during the Winter Session. *The Regular Winter Course* commences Monday, November 6th, and closes on the last day of February ensuing. Three hours of each day will be devoted to attendance upon lectures, which will be illustrated to the fullest extent by a large and valuable collection of Chemical and Philosophical apparatus, and Anatomical and Pathological specimens. Tickets for the Course, including the Demonstrators', \$100; Diploma, \$30; Matriculation (paid but once), \$5. For further particulars address

J. H. McQUILLEN, Dean, S. W. Cor. 21st and Arch Sts.

THE
MISSOURI DENTAL JOURNAL,

HENRY S. CHASE, M. D., D. D. S., Editor.

VOLUME VIII.

The Publishers of the Journal, being desirous of extending its circulation to the fullest possible extent, will send specimen copies to any part of the world on receipt of the address of dentists wishing to examine it. Address

A. M. LESLIE & CO.,

319 North Fifth Street,

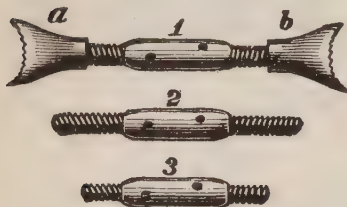
ST. LOUIS, MO.

DENTAL DEPOT.

Send for New Illustrated Catalogue.

JACK SCREWS.

Devised by Dr. C. S. LONGSTREET,
with Dr. A. McCOLLOM's Im-
proved Head.



This device is greatly prized by
those who have used it.

PRICES.

Full Set, as above, Nickel Plated,
screw and two extra bars...\$2.50

Jack Screw, Nickel Plated.....1.50

Bars, " " 50

Improved Triplex Rubber-Dam Punch.

Devised by Dr. F. W. DOLBEARE.

TWO STYLES, Nos. 1 and 2.



1st. It has in convenient
form for use three sizes of
punches.

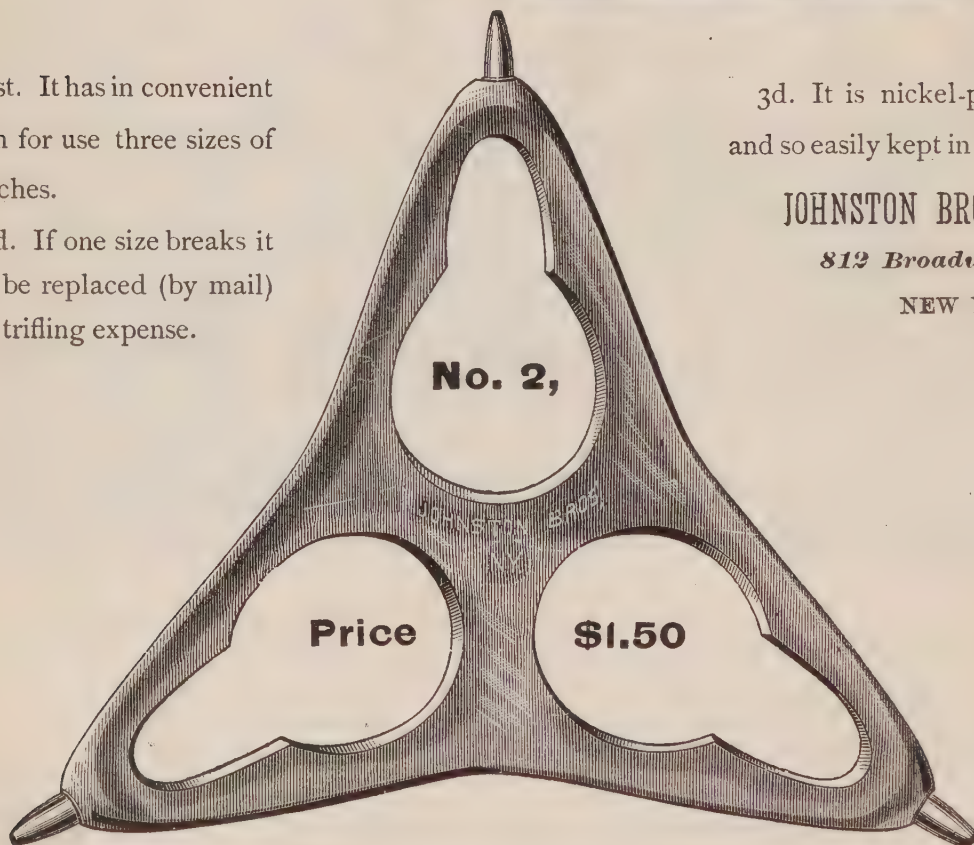
2d. If one size breaks it
can be replaced (by mail)
at a trifling expense.

3d. It is nickel-plated,
and so easily kept in order.

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SECOND-HAND CHAIRS.

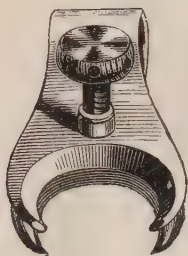
Dentists who have supplied themselves with the Morrison Chair, frequently request us to sell the chairs previously used by them. We therefore can ordinarily supply, at cheap rates, second-hand chairs of any of the varieties hitherto most used. For particulars, address

JOHNSTON BROS.,

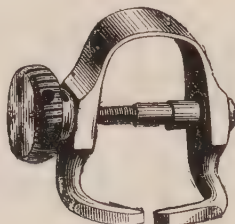
812 Broadway, N. Y.

Jarvis' Separators.

(PATENTED SEPT. 8, 1874.)



No. 1.



No. 4.

The cuts above shown are full size, and represent an apparatus for separating teeth. It is almost impossible to overstate the value and convenience of the devices. By their use, without delay to the operator or appreciable pain to the patient, adjacent teeth may be forced apart for any of the various purposes for which it has been customary to wedge teeth. Crowded teeth can be readily parted by using the separators, so that rubber dam can be applied without difficulty or loss of time. Two forms are shown by the cuts ; of the first form we make three sizes, **No. 1, No. 2, and No. 3.**

The Separator consists of a piece of steel, nickel-plated, bent upon itself, having the two ends formed to fit the outer portions of the proximate surfaces of two adjoining crowns.

These jaws are forced apart by the action of a screw, which passes through one and against the other of them. This form is applicable to all the bicuspid and molars. It does not touch the gums or injure the teeth, neither does it cause pain sufficient to be of consequence. The whole instrument is drawn to a spring temper. The jaws are thin, in order to be out of the way, and also the more perfectly to adapt themselves to the surfaces of the crowns of the teeth than if they were rigid. The appliance may be left on, in many cases, while operating, or if removed the space gained by its use may be retained by inserting a wooden wedge.

The Compound Wedge, No. 4, consists of two wedges approaching or passing each other. This is especially applicable to the incisor teeth, and will be found particularly useful in making room for passing rubber dam around crowded teeth. In use, a small strip of wood should be placed over the teeth and beneath the cross-bar, to prevent the points from sliding towards the gum.

PRICES.

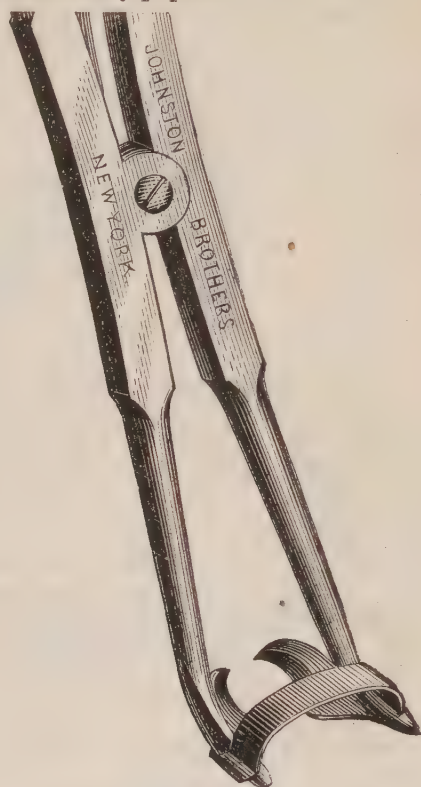
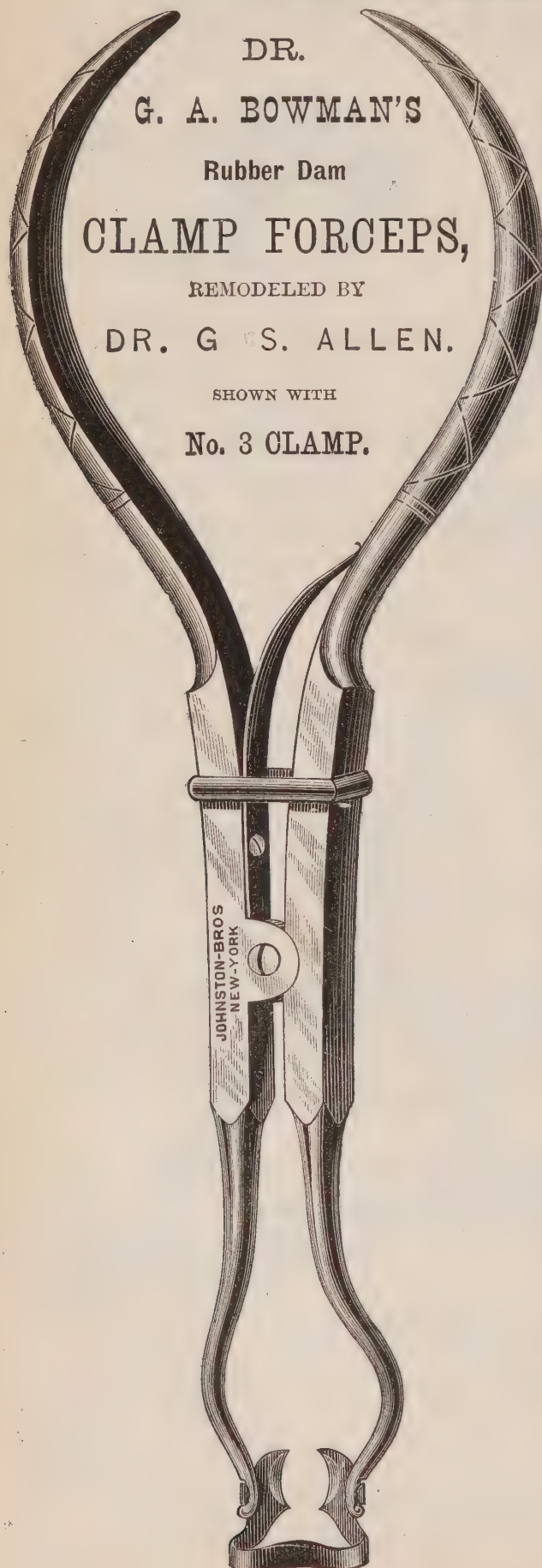
Complete Set of Four	\$6.00
Any Single Instrument.....	2.00

JOHNSTON BROS.,

812 Broadway, N. Y.

RUBBER DAM CLAMP FORCEPS.

Of these we offer two styles, both deservedly popular.



POINTS OF DR. T. C. ROYCE'S Rubber Dam Clamp Forceps,

Shown with Clamp. Handles are exactly like the other style, (Bowman's.)

Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

If so ordered we can supply either style of Forceps with a band, which will keep the Forceps and Clamp extended and ready for use when the hand of the operator is removed, as shown on the Bowman Forceps.

PRICES.

Forceps, either style	\$3.00
“ “ “ Nickel Plated....	3.50
Complete set of Clamps, embracing eight forms.....	4.00
Complete set of Clamps, embracing eight forms, plated.....	4.80
Clamps, each.....	50
“ plated.....	60

JOHNSTON BROS.

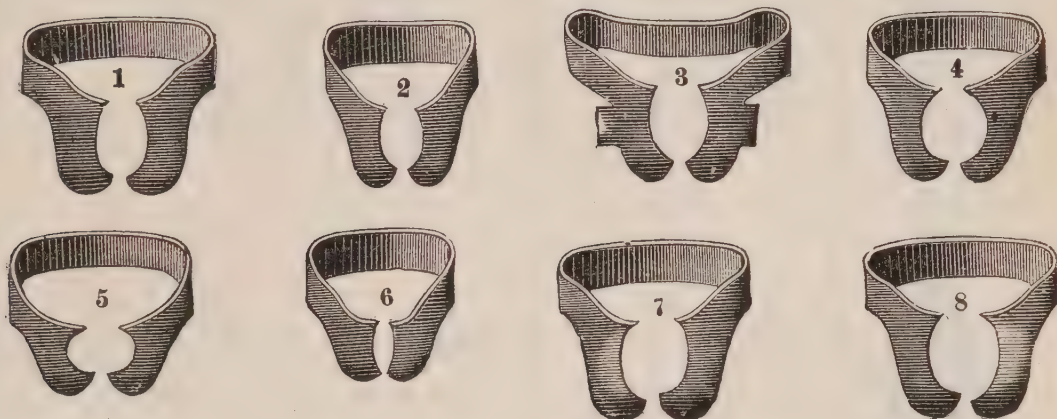
We were never more sure of doing signal service to the
Dental Profession than now in offering the

IMPROVED

Rubber Dam Clamps,

INVENTION OF

DR. DELOS PALMER, OF NEW YORK.



Price, set of Eight, { Oil finish, \$4.00. Each plain, 50 Cents
Nickel plated, 4.80. " Nickeled, 60

For use with Rubber Dam Clamp Forceps.

These Clamps are designed to be placed on the tooth at the commencement of the operation. Afterwards apply the Rubber Dam by passing it over both tooth and clamp.

DESCRIPTION.

Nos. 1 and 2.—Universal Clamp for Molars.

No. 3.—For posterior cavities in molars standing alone.

No. 4.—For third molars, or any molar of a cone shape. This Clamp can oftentimes be turned around while on the tooth, so as to place the bow of the Clamp out of the way of the operator.

No. 5.—For bicuspid.

No. 6.—For lateral and central incisors.

Nos. 7 and 8.—RIGHTS AND LEFTS.—For cavities under the gum, on the buccal or lingual surface of molars.

Cuts of two favorite styles of Rubber Dam Clamp Forceps will be found on another page.

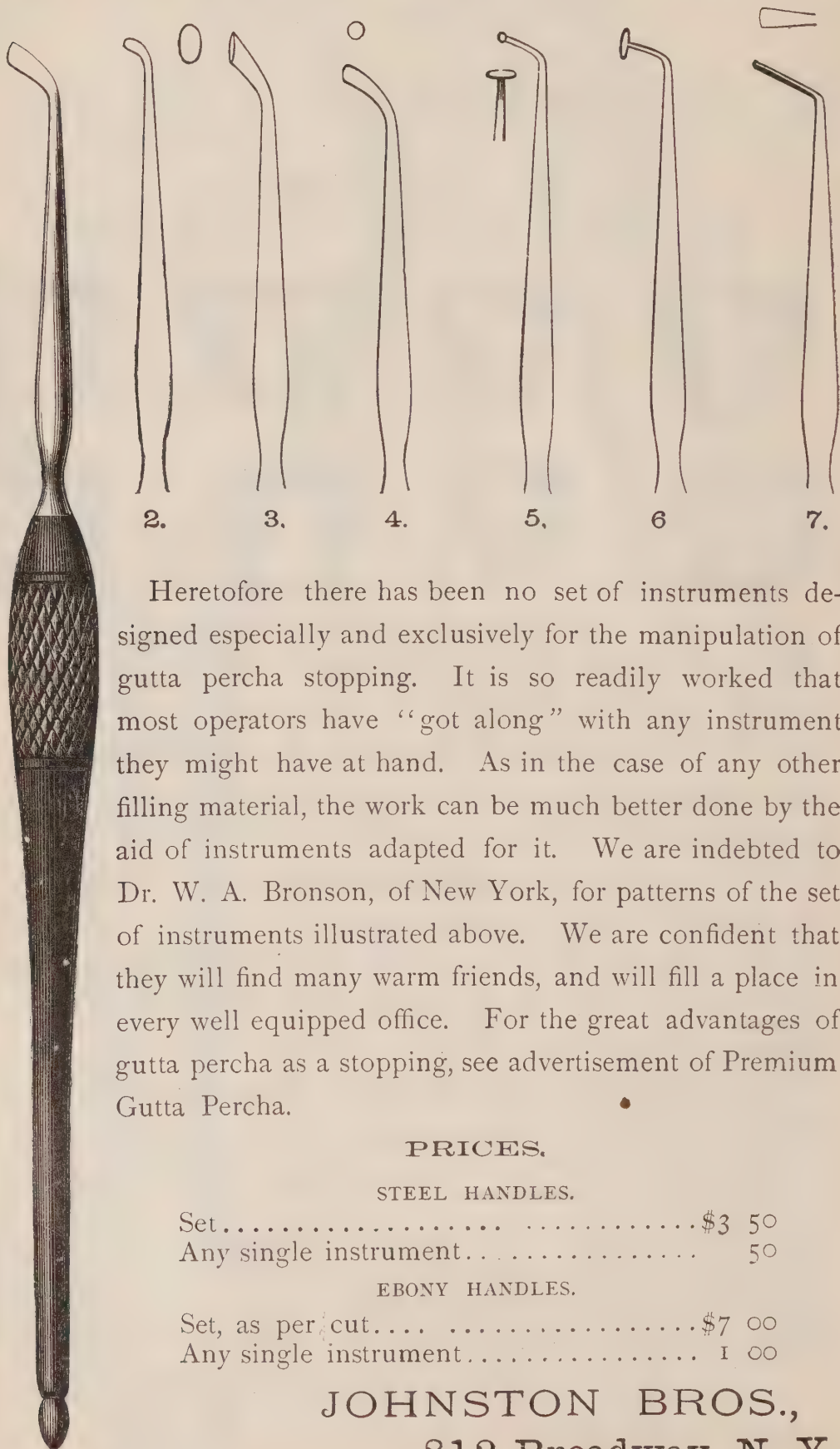
These Clamps have prominent points of marked superiority over those of other manufacturers.

First. Each has been carefully adapted to the shape of the tooth for which it is designed, *under the personal supervision of Dr. Delos Palmer*, the inventor.

Second. A groove is made by us in the clamp, into which the forceps nicely fit, so that the clamps firmly hold their position on the forceps, when once adjusted, instead of tilting from one position to another—as is the case when no groove is provided.

JOHNSTON BROS.

DR. W. A. BRONSON'S GUTTA PERCHA INSTRUMENTS.



Heretofore there has been no set of instruments designed especially and exclusively for the manipulation of gutta percha stopping. It is so readily worked that most operators have "got along" with any instrument they might have at hand. As in the case of any other filling material, the work can be much better done by the aid of instruments adapted for it. We are indebted to Dr. W. A. Bronson, of New York, for patterns of the set of instruments illustrated above. We are confident that they will find many warm friends, and will fill a place in every well equipped office. For the great advantages of gutta percha as a stopping, see advertisement of Premium Gutta Percha.

PRICES.

STEEL HANDLES.

Set.....	\$3 50
Any single instrument.....	50

EBONY HANDLES.

Set, as per cut.....	\$7 00
Any single instrument.....	1 00

JOHNSTON BROS.,
812 Broadway, N. Y.

CATALOGUE OF Instruments for Dental Engines.

Each Bur will fit either the Morrison, Suspension or White Engine.

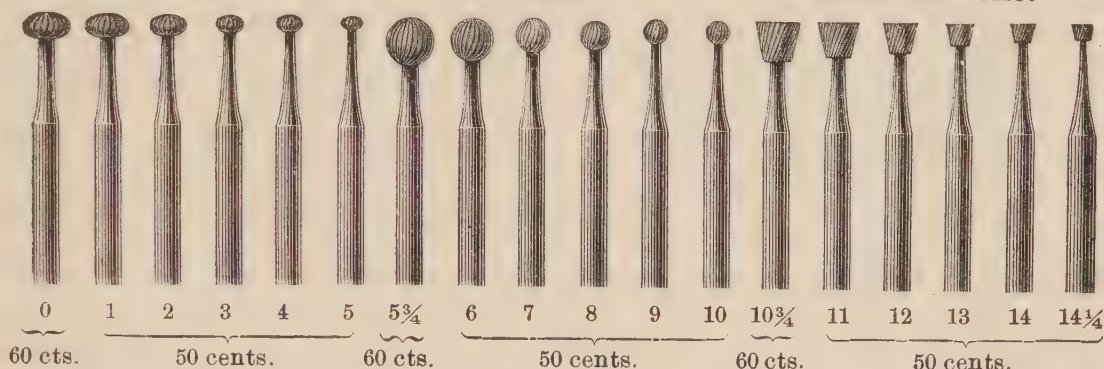
Patented September 10, 1872, February 24, 1874.

PLUG FINISHING BURS.

Oval.

Round.

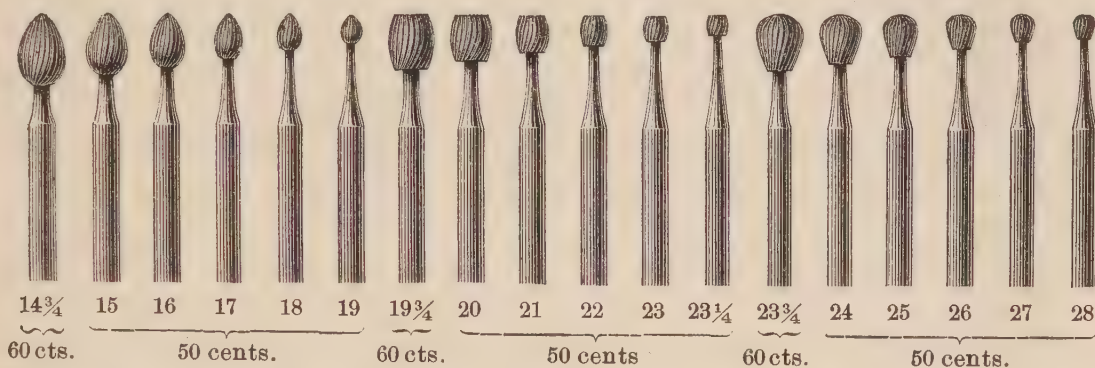
Inverted Cone.



Bud Shape.

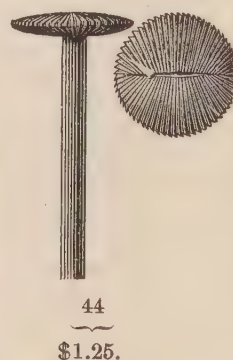
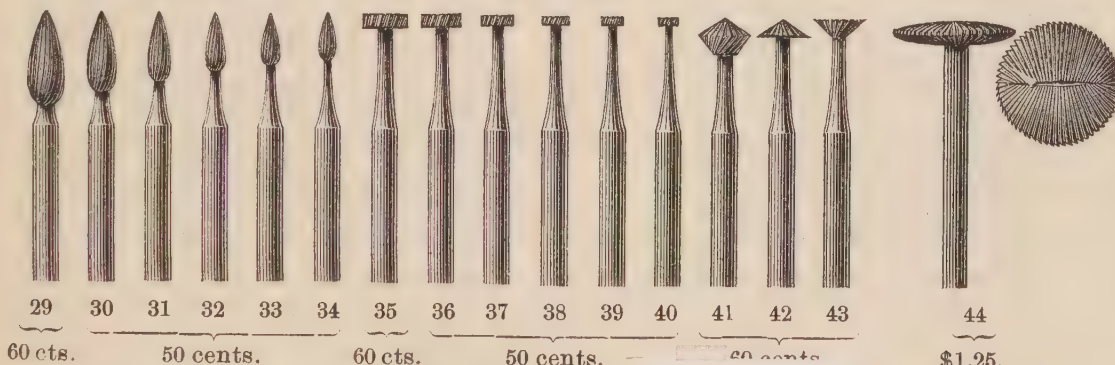
Barrel Shape.

Pear Shape.



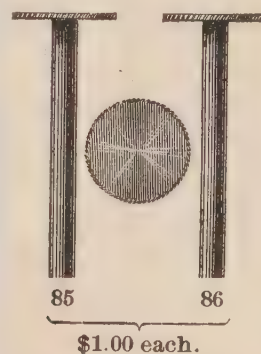
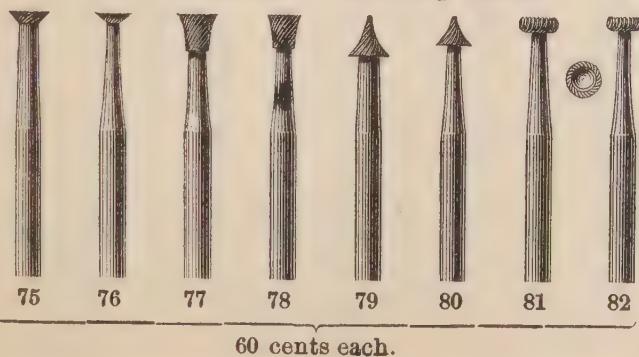
Flame Shape.

Wheel Shape.



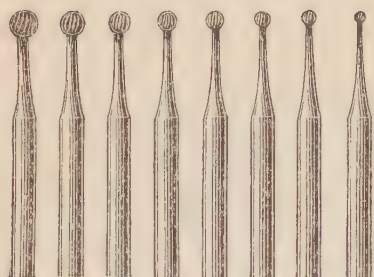
New Forms Finishing Burs.

Plate Saws.



CAVITY INSTRUMENTS.

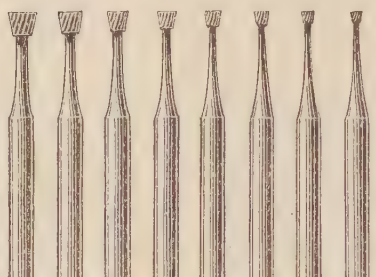
Round.



100 101 102 103 104 105 106 106 $\frac{1}{2}$

25 cents each.

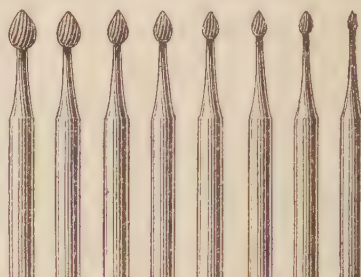
Inverted Cone.



107 108 109 110 111 112 113 113 $\frac{1}{2}$

25 cents each.

Bud Shaped.

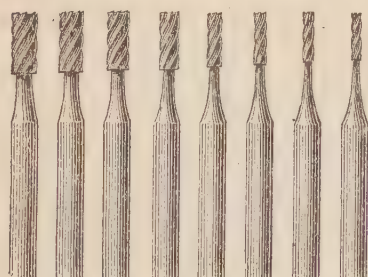


114 115 115 $\frac{1}{2}$ 116 117 118 118 $\frac{1}{2}$

25 cents each.

For extra large sizes of these forms see below, Nos. 154 to 177.

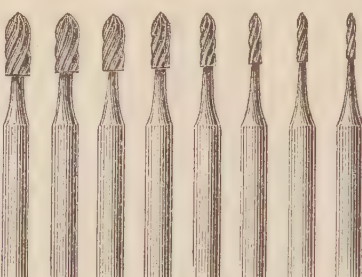
Square Fissure.



119 120 120 $\frac{1}{2}$ 121 121 $\frac{1}{2}$ 122 123 124

25 cents each.

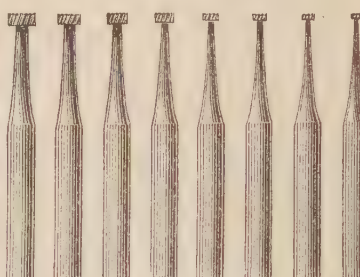
Pointed Fissure.



125 126 126 $\frac{1}{2}$ 127 128 129 130 130 $\frac{1}{2}$

25 cents each.

Wheel.

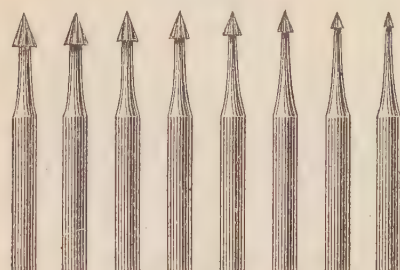


131 132 133 134 135 136 137 137 $\frac{1}{2}$

25 cents each.

For extra large sizes of these forms see below, Nos. 154 to 177.

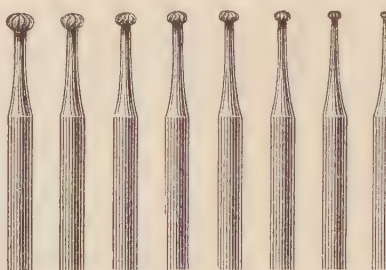
Cone Shaped.



138 139 140 141 142 143 144 145

25 cents each.

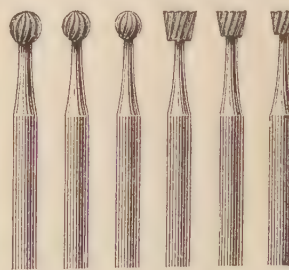
Oval.



146 147 148 149 150 151 152 153

25 cents each.

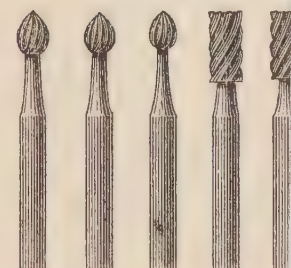
Extra Sizes.



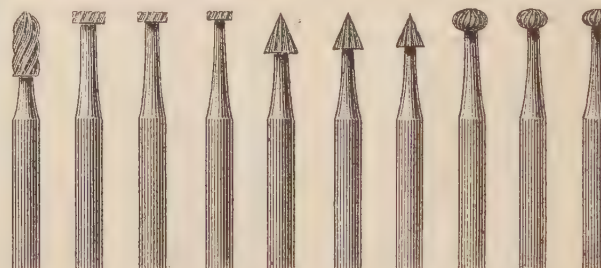
154 155 156 157 158 159

35 cents each.

of Various Shapes.



160 161 162 163 164

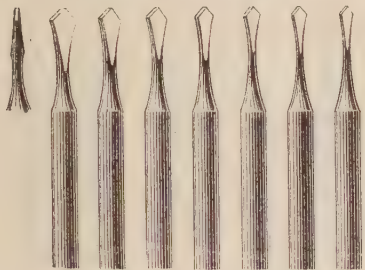


168 169 170 171 172 173 174 175 176 177

35 cents each.

CAVITY INSTRUMENTS.

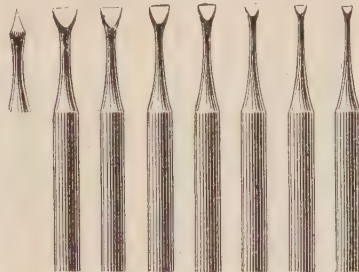
Spear Shaped Drills.



200 201 202 203 204 205 206

25 cents each.

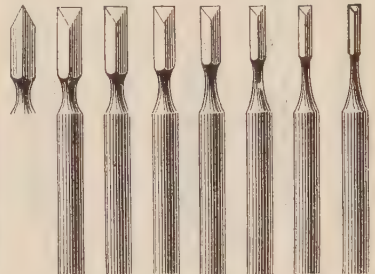
Spade Drills.



207 208 209 210 211 212 213

25 cents each.

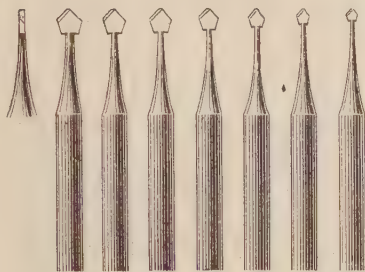
Square Drills.



213 1/2 214 214 1/2 215 216 217 218

25 cents each.

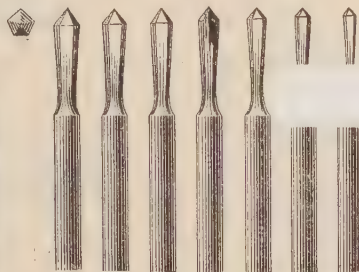
Forbes' Drills.



260 261 262 263 264 265 266

25 cents each.

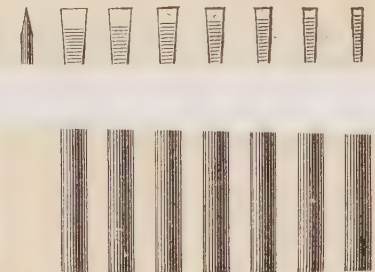
Five Sided Drills.



267 268 269 270 271 272 273

25 cents each.

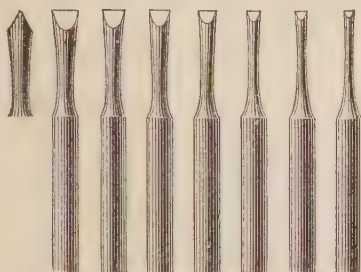
Flat Drills.



274 275 276 277 278 279 280

25 cents each.

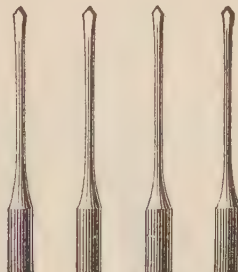
Round Drills.



281 282 283 284 285 286 287

25 cents each.

Drills for Mack's Screws.



288 289 290 291

40 cents each.

No 291 is for Gold Screw No. 1

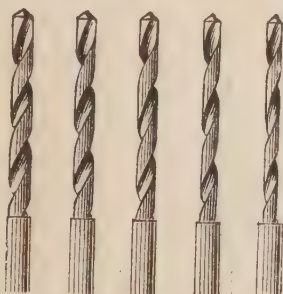
" 290 " " " " 2

" 289 " " " " 3

" 288 " Pivoting Screws.

CAVITY INSTRUMENTS.

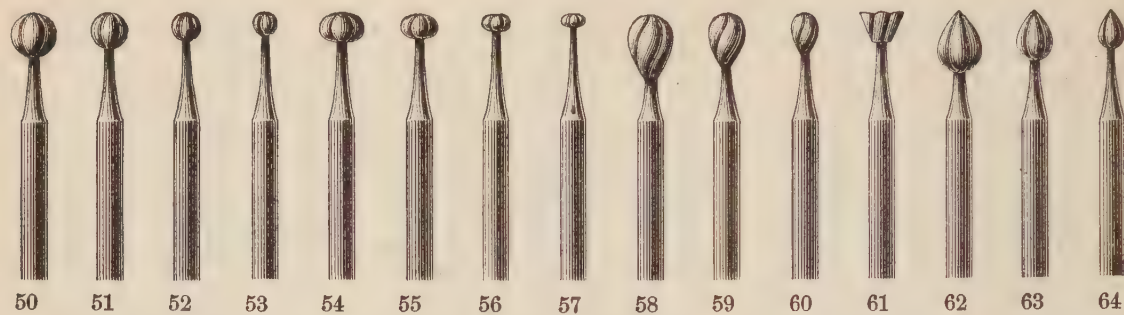
Twist Drills.



219 220 221 222 223

Miscellaneous Finishing Instruments.

Burnishers.



75 cents each.

Same sizes, not corrugated, 50 cents each.

Screw Mandrel, without Collar.

No. 65.

13 cents.

Plain Chuck for Wood Points.



No. 69.

Plated, 35 cents each.

Plain, 25 " "

Screw Mandrel.



No. 66.

25 cents each.

Port Polisher.

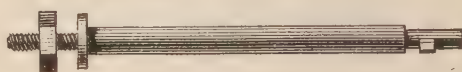


No. 67.

Screw Socket, Nickel Plated, 35 cents each.



Parting Nut Mandrel.

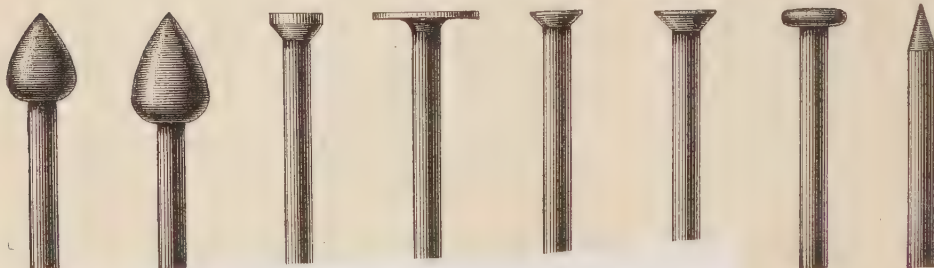


No. 68.

Nickel Plated, 40 cents each.

Plain, 30 " "

Wood Polishing Points.



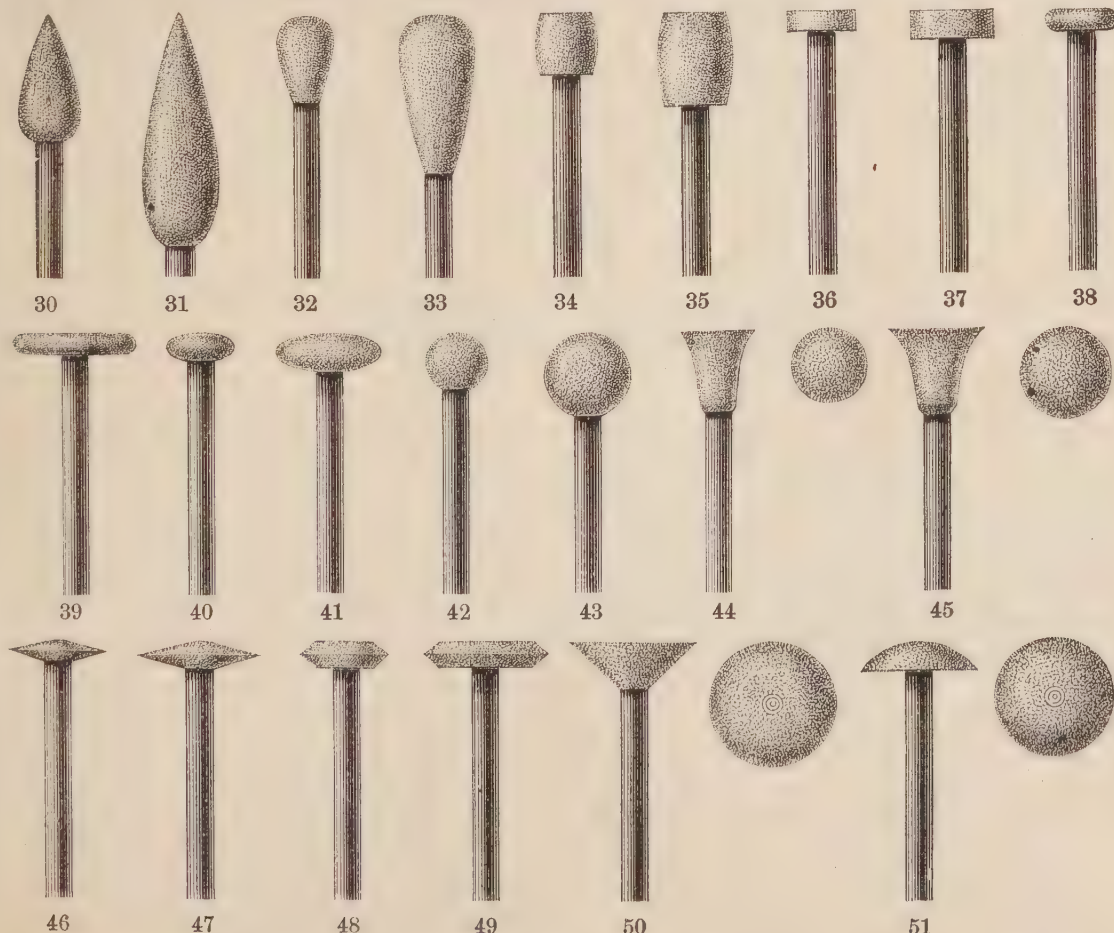
Mounted, per set.....\$1 50
 Mounted, per dozen..... 1 50
 Not Mounted, per set..... 75
 Not Mounted, per dozen..... 75

Wheels as in cut No. 13, per dozen.... \$1 50
 Or Mounted, per dozen..... 2 75
 Rubber Disks, Hard, per dozen }
 Rubber Disks, Soft, per dozen } 1 20

Soft Rubber Points, Shapes of Corundum Points, per dozen.....75 cents.

ARKANSAS AND HINDOSTAN STONE.

These are kept in stock, mounted on Mandrels, of the forms represented below. Scotch Stones will be made to order of any of the same forms, but this Stone is so soft, that we do not deem them desirable except for such shapes as are without sharp angles.



Arkansas Stones, \$1.00 each. Hindostan Stones, 50 cents each. Scotch Stones, 30 cents each.

We invite the fullest examination of all of our Engine Instruments, as regards

The quality of the steel from which they are made.

The shape and finish of the cutting edge:

Their temper.

The rapidity with which they cut.

Their durability.

The shaft of each instrument is *round and highly finished*, and can therefore be used without unreasonable and unnecessary injury to the nose of the hand-piece, which injury occasions unsteadiness in all the uses of the Engine.

They will *bear examination in quality and price.*

MINIM BURS.

It is impossible to accurately represent by cuts the smallest sizes of Burs that we make. We offer Cavity Burs, either Round, Inverted Cone, Bud-Shaped, Wheel, Cone-Shaped or Oval, of smaller sizes than are represented or numbered herein. Although more than ordinarily expensive to make, **we keep the price the same as for ordinary Cavity Burs.** In sending orders, please specify the shape desired, as for example: "ONE DOZEN ROUND MINIM BURS."

SPECIAL OFFER.

A discount from list prices of ten (10) per cent. will be given on all cash orders for Engine Instruments which amount to twenty-five dollars or upwards.

PRICES OF ENGINE EQUIPMENTS.

Plug Finishing Burs.....	\$6 00	per doz.	50 cts. each
Extra Size Finishing Burs.....	7 20	"	60 "
Stoned Finishing Burs.....	12 00	"	1 00 "
Extra Sizes proportional prices.			
Excavating or Cavity Burs.....	3 00	"	25 "
Extra Sizes.....	4 20	"	35 "
Stoned Excavating or Cavity Burs.....	6 00	"	50 "
Stoned Excavating or Cavity Burs, Extra Sizes proportional prices.			
Minim or very Small Burs, Round, Bud, Wheel,			
or Cone shaped.....	3 00	"	25 "
Right Angle Cavity Burs and Drills.....	3 00	"	25 "
Trephines.....			75 "
Screw Mandrels, with Collar.....	3 00	"	25 "
Screw Mandrels, blanks (no collar), for Mounting Wooden			
Wheels, Leathers, &c.....	1 50	"	13 "
Large Knife Edge Wheel Burs.....			1 25 "
Plate Saws.....			1 00 "
Burnishers, Corrugated.....	9 00	"	75 "
Burnishers, Smooth.....	6 00	"	50 "
Parting Nut Mandrels, Nickel Plated.....	4 80	"	40 "
Parting Nut Mandrels, plain.....	3 60	"	30 "
Drills of all forms and sizes (except Nerve Drills).....	3 00	"	25 "
Nerve Instruments.....	4 80	"	40 "
Leathers, Mounted.....	3 00	"	25 "
Leathers, not Mounted.....	1 00	"	10 "
Bands for Engine, Morrison.....	1 20	"	10 "
Bands for Engine, Suspension.....	1 80	"	15 "
Ive's Tongue and Cheek Protectors (2 sizes), to be used			
with disks, wheels, &c..... per set,	1 50		75 "
Right Angle Attachments.....			5 00 "
Arkansas Stones, Mounted.....	12 00	"	1 00 "
Hindustan " ".....	6 00	"	50 "
Scotch " ".....	3 60	"	30 "
Corundum Points, Mounted.....	1 50	"	13 "
Corundum Points, not Mounted.....	75	"	7 "
Rubber Disks, hard or soft.....	1 20	"	
Twist Drills.....	4 80	"	40 "
Boxwood Disks (3 sizes, see cut).....	1 00	"	10 "
Wood Socket or Port Polisher, plain.....			25 "
Wood Socket or Port Polisher plated.....			35 "
Wood Socket or Port Polisher, Screw Socket.....			35 "
Corundum Wheel, No. 13, $\frac{7}{16}$ in. diameter.....	1 50	per doz.	13 "
Soft Rubber Points, shape of Corundum Points.....			75 cts. per doz.
Wood Polishing Points.....			\$1 25 per Box.

We are prepared to furnish any of the instruments illustrated in this pamphlet, adapted to either the A, B, or C style Hand Piece. The C style Instrument also fits the S. S. White Engine.

In ordering instruments, designate them by the numbers, and state whether they are wanted to fit the (A,) (B,) or (C) hand-piece. Each bur is numbered on its shank.

Style A.



Style B.



Patented Sept. 10, 1872.

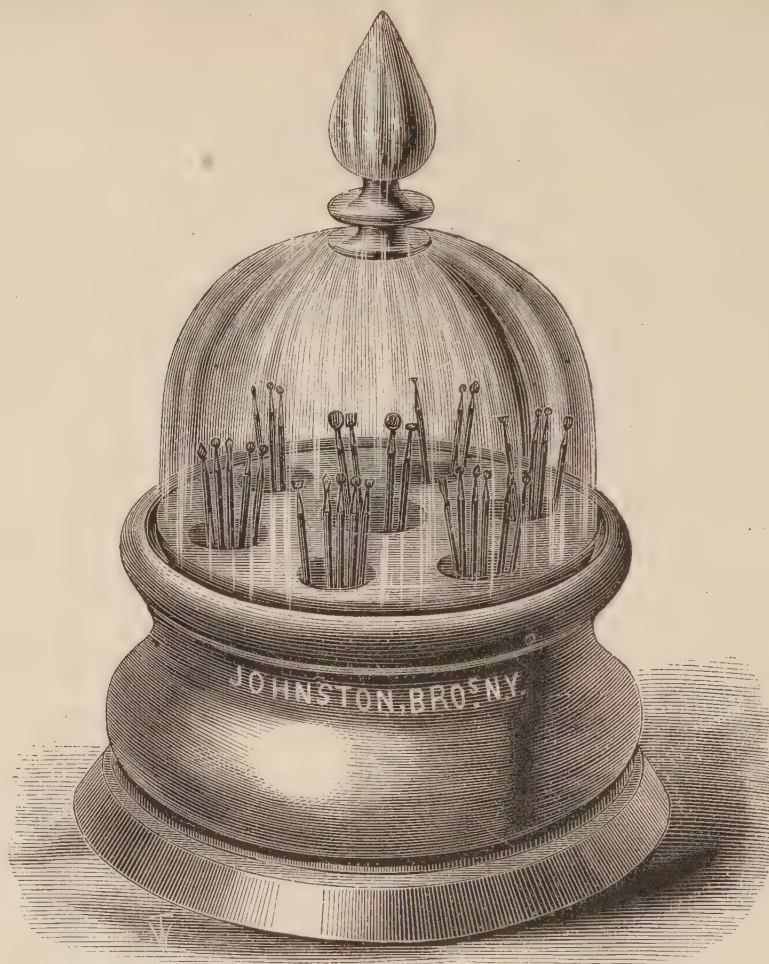
Style C.



Patented Feb. 24, 1874.

NOTE.—To fasten Burs in the Hand Piece, it is well to push back the catch-spring with the left hand while inserting the Bur with the right hand.

Instrument Stands for Engine Tools.

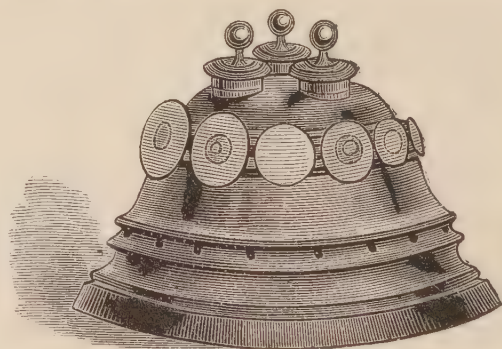


No. 1 as above. **No. 2** with many more, but smaller holes.

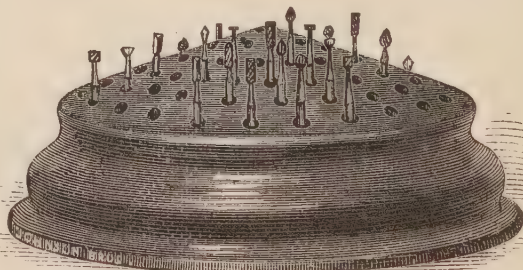
This is made of rosewood and maple in alternate layers, and is very ornamental. Besides the form shown above, we have another like this in all respects, except that the holes into which the burs are placed are made so small as to hold only one or two instruments each. We call this No. 2.



No. 4.



No. 5.



No. 3.

The cuts above show at a glance the advantages offered by these new styles of stands. The conical shape of the top of the bur stand renders it much easier to select and to remove any particular instrument desired than is possible when the top of the stand is flat, because in the first named case each bur is brought distinctly into view.

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PRICES.

Nos. 1 or 2, complete, each.....	\$2 00
Or without glass cover.....	1 50
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No. 5, having three cups for paste.....	2 00

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PATENTED FEB. 16th, 1875.

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No. 2, “ $\frac{5}{8}$ in.....	2 75
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The peculiar advantages of this style of engine over any other are marked and obvious:

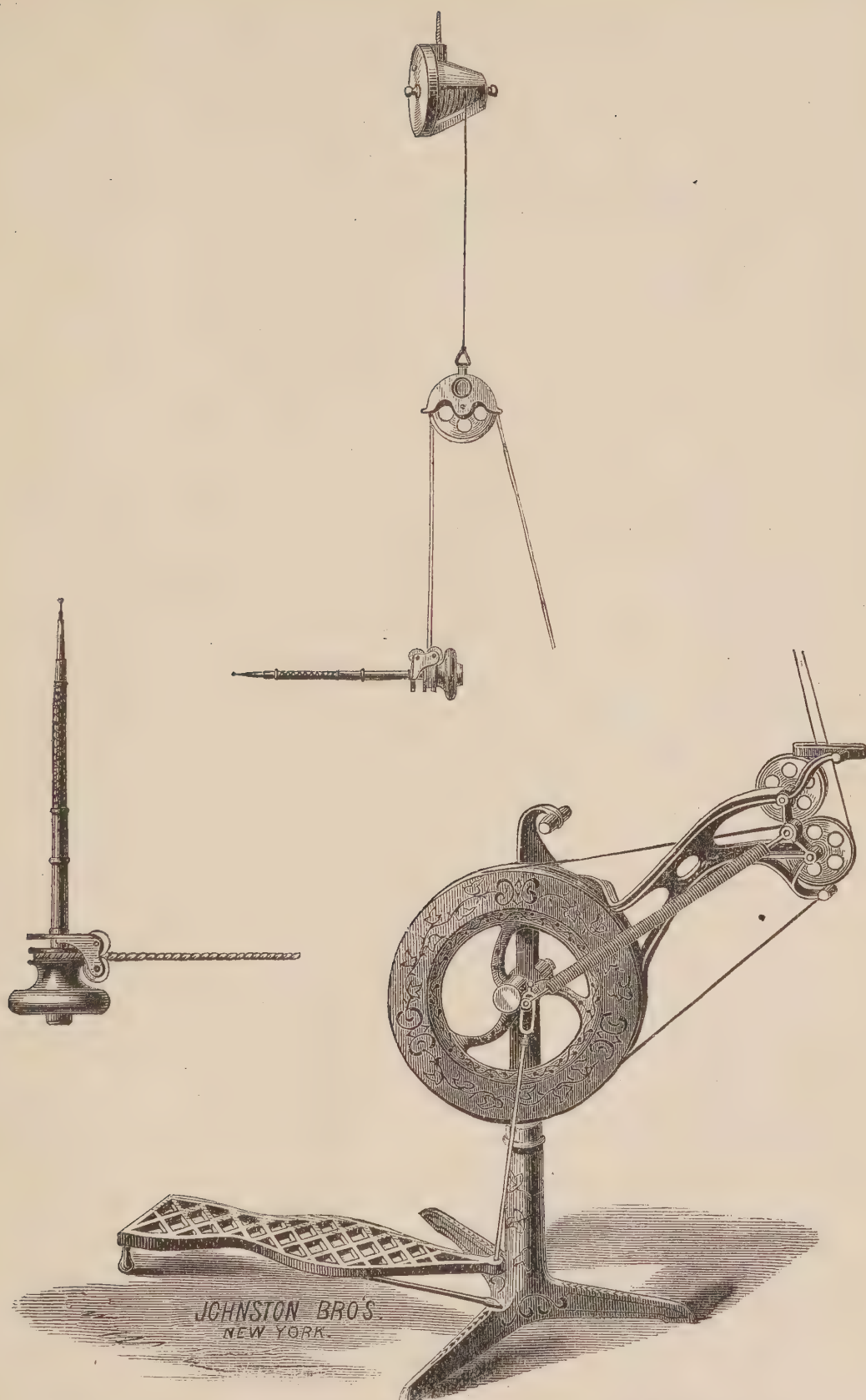
1st. The belt from the driving wheel is carried directly to the shaft in the hand-piece without the intervention of either cable or other spring. Therefore the motion conveyed is positive, steady, and without the least "back-lash." Large burs and disks run perfectly steady in this engine. No other dental engine will compare with the Suspension Engine for steadiness of motion.

2d. It is suspended from the ceiling by a cord, and so is directly in front of the patient, and is free to move in every direction. Every part of the mouth can be reached by the hand-piece.

3d. It is preeminently a *light running* engine.

4th. The fusee, which is screwed into the ceiling, exactly counter-balances the weight of the hand-piece, which can therefore be raised or lowered and left in any position you may choose to leave it, or by a simple adjustment of the coiled spring of the fusee it can be made to raise the hand-piece immediately on its release from the hand of the operator.*

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(DR. ELLIOTT'S INVENTION.)

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—1876—

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JOHNSTONS' Dental Miscellany,

A NEW MONTHLY JOURNAL

OF

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3d. By the constant search for, and publication of items of office practice, which serve to show the methods adopted by eminent and experienced dentists to overcome the little perplexities of every-day practice, and to shorten the operations in both laboratory and operating room.

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25 West 23d St., New York, Feb. 18th, 1876.

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Truly yours,

J. G. AMBLER.

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GENTS: I have thoroughly tested the Gutta Percha filling prepared by you, and must say it is the best compound of its kind for filling teeth I have found in twenty years' practice. Yours respectfully,

S. L. GEER, Dentist.

Aiken, S. C., Feb. 17th, 1876.

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MESSRS. JOHNSTON BROS.,

Springfield, Mass., Feb. 24th, 1876.

DEAR SIR: I have been using your "Premium Gutta Percha Stopping" for two months, in place of Hill's Stopping. It is much harder than the latter, and I hope will prove more durable. I need a longer time to test its comparative value, but shall give it the preference over any other preparation of Gutta Percha I have ever tried until fully tested. Yours truly,

F. SEARLE.

1418 Washington Ave., St. Louis, Feb. 19th, 1876.

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GENTLEMEN: In reply to yours of the 15th, I most willingly attest to the merits of your Gutta Percha Stopping.

As a protection to pulps from thermal changes it is a perfect insulator; as a stopping it serves a perfect purpose; and protected from mechanical violence is indestructible, while its facility of manipulation renders it additionally desirable.

Yours truly,

EDGAR PARK.

New York, Feb., 1876.

GENTLEMEN: I have given your Premium Gutta Percha Stopping a reasonable trial, sufficient to convince me of its durability, and of the many other good qualities of which it is possessed. I therefore highly recommend it, not only for temporary, but also for a great many permanent fillings.

Very respectfully yours,

W. S. BEDELL, Dentist.

St. Johns, Newfoundland, February 29th, 1876.

MESSRS. JOHNSTON BROS.,

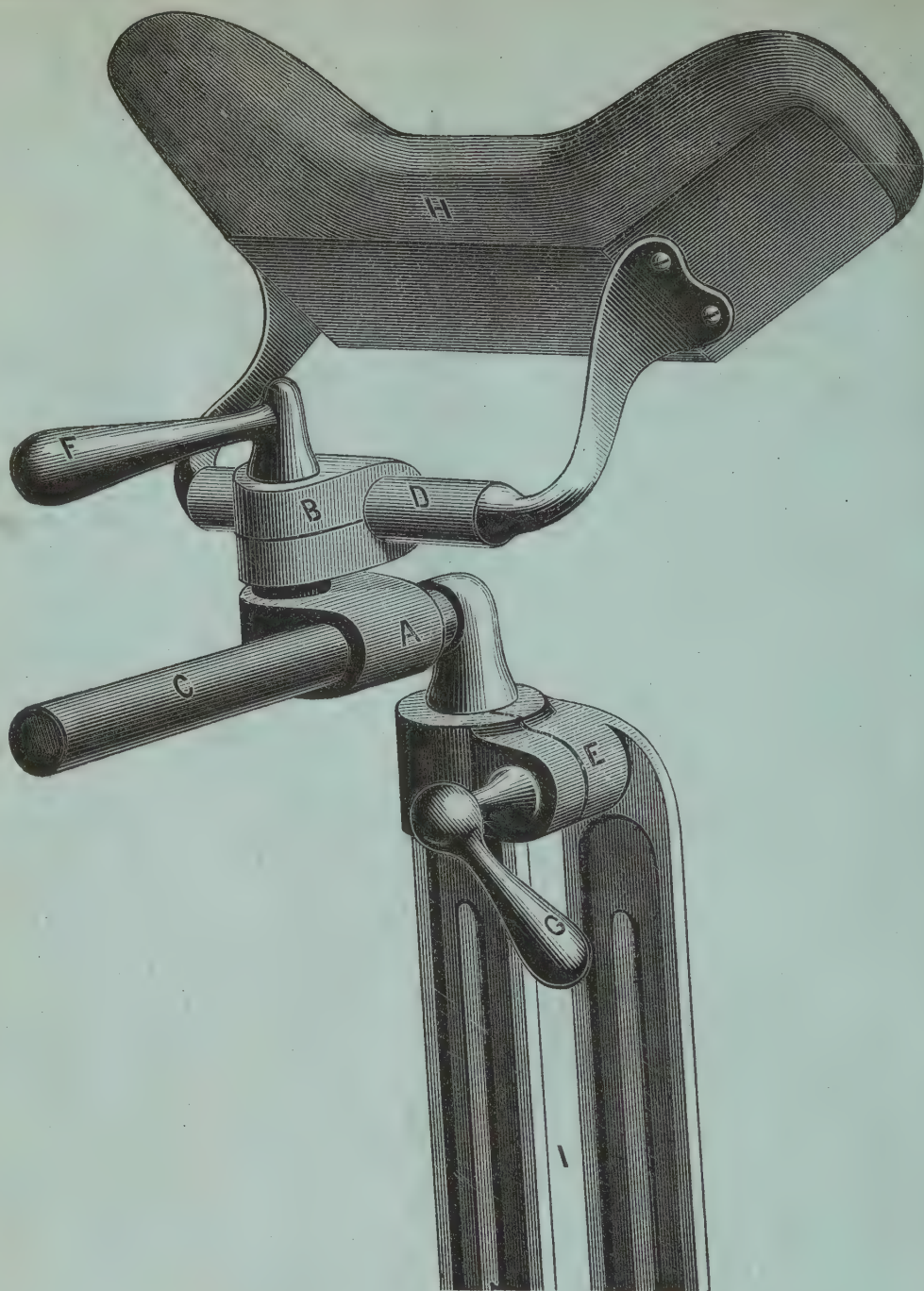
GENTLEMEN: You ask for my opinion of your "Premium" Gutta Percha filling, and I'm glad to say I can recommend it. If you remember, you sent me a sample a few weeks since. I've used it several times, and have been pleased to find an absence of all ropy and sticky tendencies. It manipulates beautifully; in fact, it's just the thing we've been wishing for as a temporary stopping. Please accept our thanks. Very truly yours,

H. H. BURNETTE.

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VOL. 3.

No. 30.

Johnstons'
Dental Miscellany,

A MONTHLY JOURNAL OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

JUNE, 1876.

NEW YORK:
JOHNSTON BROTHERS,
812 BROADWAY.

JOHNSTON'S DENTAL MISCELLANY,

FOR 1873.

It is certainly reasonable cause of self-congratulation on the part of the publishers of this Journal, that the end of the first year of its publication finds it with a large and constantly increasing list of subscribers, and that they are constantly in receipt of letters of encouragement and commendation from their readers in every section of the country, and even from distant portions of the world, one such letter being recently received from Japan.

We are promised one or more articles from each of the following gentlemen of established reputation, and others of like standing in the profession have encouraged the expectation of like favors from them.

Dr. A. L. NORTHRUP, New York.	Dr. JOHN ALLEN, New York.
Dr. WM. H. ALLEN, New York.	Dr. W. GEO. BEERS, Montreal, Canada.
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Dr. T. H. CHANDLER, Boston.	

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JOHNSTONS'

Dental Miscellany.

VOL. III.—JUNE, 1876.—No. 30.

SHALL I GO TO EUROPE?

By GEO. W. FIELD, D.D.S., London.

This question is frequently asked by members of our profession in America. It is no longer Westward, ho! but to the East is now the cry.

In view of this reversal of the long-established law and custom, I shall undertake to state a few facts regarding dental practice in Europe.

During my residence on this side of the *water*, the number of American dentists coming to Europe seems to have annually increased. The seductive reports of the large and easily acquired fortunes made by American dentists abroad have turned the heads of many who were doing well at home, and who now are convinced that "a bird in hand is worth two in the bush." Some of these men have left a lucrative practice and an appreciative patronage to start anew in a strange land, hoping to acquire one of "these fortunes" awaiting them in Europe, and they have found that in this, as in all lotteries, there are many blanks to one prize. The *fortune-hate* dentist is as great an exception as in America.

The time was when the name of "American Dentist" was the open sesame to a large and profitable practice. There was a very high grade of skill exacted, for the people believed that "American Dentist" and superior skill were synonymous terms. Hence the early adventurers were pecuniarily successful. To-day the contrast is painful to contemplate, both as to reputation and pecuniary advantage. The latter is and

always has been the most carefully looked after, and the result is a great deterioration in the class of operations.

The native dentist, seeing the charm that attached itself to the name "American Dentist," soon learned that he could go to the States, and on the strength of having been in practice a few years procure a diploma which would be to him an open sesame to a large practice, for he could say, "I studied in America," even though his whole *visit* occupied but six months. "Il a fit ses etudes en Amerique." He has swallowed a few technical terms, has added to his former *Materia Medica* (arsenic and creosote), carbolic acid, oil of cloves, etc., has learned to introduce gold so that it cannot fall out, provided the cavity is *sufficiently* large *inside*. He is equipped with an "engine," a new chair, "et tous les outils (*tools*) comme vous Monsieur le Docteur." This is the D.D.S. who is held up to our admiring gaze as a compeer. The masses of the people are totally ignorant as to what should constitute a qualified dentist, consequently he who endeavors to practice our specialty in such a manner as to reflect some honor on his profession is limited in the making of a clientele to the very small minority of intelligent and appreciative people, and even with this "crème de la crème" they have been so long accustomed to a very low fixed fee, that one who dares to ignore it and demand more has to *twice earn* it (by disagreeable explanations), while to accept the habitual fee is a guaranty that the patient shall have value received—inferior operations. It is the same in England.

A professor in the "Dental School" once said to his class, "You will find plate work your principal source of revenue, for you may labor for an hour or two over the insertion of a gold stopping, and receive the munificent fee of one guinea" (\$5.25). The inference to be drawn from this is that plate work, because more *profitable*, is of greater importance and deserving of more attention than operative dentistry, and the number of teeth prematurely sacrificed is corroborative of the correctness of this inference.

Again, many come over with limited means, expecting to step into a lucrative practice, as the rose-colored reports have led them to believe that to be an American (and to speak through the nose, so say Europeans) is a sufficient introduction. After a few months weary waiting, their funds getting low and receipts not encouraging, the conviction forces itself upon their minds that as at home so here it requires patience and perseverance, supported by good operations, to establish one's self or to gain a reputation worth possessing. He who does not

possess these qualities (and money enough to wait) had better remain at home, unless he is willing to commence as assistant to some well established man.

I would not be understood as wishing to discourage any from coming to Europe ; my only object is to disabuse the minds of many of these false impressions of the easy success here. Of the many who have been here for years, but a few have met with more than the *ordinary* success of the dentist at home, a good living, a *small* surplus each year, hard and steady work—with expatriation of one's self. There is plenty of room for more, but the elements of success are the same as in New York; one must apply himself just as assiduously and laboriously, perform just as good operations and wait just as long for a reputation. In short, let the same standard be adopted and conscientiously adhered to as the A No. 1 men at home have adopted, and the same reward awaits. The fees are not so large for the same class of operations as at home, but that rests entirely with the operator, as is proven by the four or five American dentists, and one foreigner (a D.D.S., by the way) who commands as high fees as any in America, except our New York friend.

With this statement of the facts as they appear to me, I shall leave it with those who have the European fever to answer the question, Will it pay?

FACIAL NEURALGIA,

Deriving its origin from abnormal complications in the teeth or mouth.

PRIZE ESSAY, BY J. F. BABCOCK, D.D.S.

Concluded.

In response to the call made upon me for my assistance, I was soon after at my patient's bedside ; I found her very pale, her left eye very badly inflamed, and already much emaciated by the intensity of her sufferings for the past four days. She was moaning piteously and with an occasional shriek; as a spasm of pain would traverse the nerves in the side of her face, she would cry out to her Creator to relieve her from her agony. For ninety-six hours she had not obtained any sleep whatever, and could only secure temporary relief through taking ice-water into her mouth, and then immediately emptying it out again, repeating the operation constantly. This

she was obliged to do so often, that in the course of twenty-four hours she would, in emptying the water from her mouth, fill an ordinary wash-bowl some five or six times; in fact, so often was she obliged to sip the water, that it was only with the greatest difficulty that I could make an examination of her teeth, but after some perseverance I partially succeeded, and upon concussion with an instrument I succeeded in finding four teeth, the periosteum upon the roots of which was highly inflamed. I endeavored to make local treatment but found it to be utterly impracticable, owing to the fact that the constant severity of the pain made it imperative that she should have the ice-water in her mouth *continually*. Finding it impossible to resort to the usual measures, I gave her a teaspoonful of the following prescription:

Quinine, Sulph., 30 grs.,

Acid. Sulph. Aro., $\frac{1}{4}$ oz.,

Elix. Calisaya Bark, 14 drachms,

Mix,

when almost instantly the pain ceased, and for some three minutes she experienced entire relief, falling asleep at once; whereas before the intense pain had been *unremitting*. At the end of that time it returned, but with abated force, and before leaving, which was in the course of an hour, the paroxysms were very much lessened in their frequency and intensity. I left the above preparation, with orders that the dose be repeated at 2 o'clock P. M. (two hours later), and upon returning at 3 o'clock, I found her comparatively comfortable, but still suffering an occasional twinge of pain once about every fifteen minutes. The water had been entirely discarded, and her gratitude to me for what relief I was but the instrument in affording was very marked. Morphine was left for her to take, and upon calling the next day I found that she had slept soundly and since the night before had suffered scarcely any. I now made a more satisfactory examination. The teeth (superior bicuspids and molars on left side) were still quite tender in response to concussion, and no reason was found to modify my previous diagnosis as periosteal inflammation. Upon the day following she was brought to my office, when I applied three leeches to the gum distributed directly over the teeth affected, and made a free application into the wounds of tinct. of capsicum; this treatment was again repeated in about six hours, only that lancing, instead of leeching, was resorted to, and once more the day following, when the patient was pronounced cured; for all pain had ceased, and the teeth were not more than ordinarily sensitive to a quite heavy concussion from the weightiest end of a plugger. It only

remains for me to add that this extensive inflammation was the result of a *very severe cold* which she had but recently acquired through walking the deck of a steamboat in an exposed condition. We come now, in tracing those diseases of the teeth which are most familiar to us as the lesions of Facial Neuralgia, to Alveola Abscess. Lymph is susceptible to three distinct changes, which are as follows: Absorption, degeneration and organization; bearing this in mind, let us for a moment recall to our memory some one of those patients whose courage we have marveled at in their persistent endurance of pain and agony, and whose timidity we have had to commiserate when brought face to face with our forceps. Night after night have passed in sleepless agony since the foreign substance first found its way, an unwelcome intruder, into the cavity of decay, and brought its pressure to bear upon the exposed pulp, thus causing the first slight determination of blood to that point; inflammation and congestion, with the accompanying suffering, have followed in quick succession within the unyielding walls of that canal, the hard pressed vessels have succumbed and that pulp which was alive is dead; pain has vanished and self congratulations are in order. Vain illusion! that pulp has decomposed in the same manner as other dead animal matter; pus has formed, and like begetting like, the secretion goes steadily on until the flood reaches—with its poisonous miasma and irritating, deadly influence—the periosteal membrane, and that ever vigilant ally *lymph* speeds its healing influence to the threatened locality, where a struggle ensues for the mastery; but the poisonous irritant triumphs, although the fluid is poured out in great abundance. At this stage a change in the character of the fluid, lymph, occurs, and a portion of it *degenerates*, adding *its* poison to that of earlier date; another portion *organizes*, as is evident from the sac, and in that sac is the pus which resulted from the combination before alluded to; but jealous, as it were, of its liberty, the ever-increasing secretion of pus struggles with each individual corpuscle to secure, by means of pressure, an outlet. Accumulations of these corpuscles soon aggregate in sufficient numbers, and by the exertion of an irresistible effort upon the walls of organized lymph which compose the sac, they yield; not yet content, their onward course is pursued, and if fortunate in their direction the adjacent tissues yield readily by absorption to their persevering pressure, and their escape to the outer air is easily accomplished, and again, in layman's parlance, "gum boil" is the apparent result, while the whole constitutes an abscess in its simplest form. Should these corpuscles, however, find the sac which encloses them of unyielding character, then, owing to

its natural elasticity, dilation of its walls is the unfortunate result to the sufferer ; its continued enlargement involves the absorption of the alveola process, and the reactionary pressure upon the nerve fibre tissue, together with the consequent far-reaching irritation and inflammation, culminate oftentimes in that Facial Neuralgia which it is the design of this paper to illustrate. The sufferer is by this time resigned in so far as to consider the extraction of the tooth as the lesser of the two evils, but just at this point our claim to be regarded as skillful practitioners, and as being members of a *bona fide* profession, should forbid our extraction of that tooth, provided all other conditions, than the mere fact of abscess, are favorable to attempt its ultimate salvation.

Let us assume that we have diagnosed the case as acute alveola abscess ; our first step in the operation for its treatment will be to plunge a sharp-pointed bistoury, or other pointed instrument, directly into the very fountain head of the disease, and until we are able to distinguish its point directly in contact with the root of the affected tooth ; a vigorous scraping of that portion of the root which is diseased will constitute an "anti-phlogistic touch of the knife," and an irritation counter in its design and nature will be produced, which will tend to create a flow of lymph, healthy in its character ; retain the opening thus secured by means of a cotton tent, after having, with a hypodermic syringe, thoroughly washed and cleansed the cyst in tepid water. Next proceed to cleanse the pulp canal carefully (there *never* can be an abscess form until subsequent to the death of the pulp), leaving it entirely open and free from impediment, in order that the gases and pus may find outlet. This much will answer for a first treatment, since you will have relieved the intense pressure, and from the depths of a grateful heart your patient will depart to enjoy a night of luxurious rest and quiet slumber. Upon their reappearance the next day, if your artificially-created fistula is of sufficient dimensions, inject with your hypodermic a drop or two of carbolic acid, followed by the same quantity of ordinary tinct. iodine, which will effect a combination with the acid, and act as a disinfectant and healthy invigorant, while the resolvent and alterative qualities of the iodine will serve to promote a normal action. Replace your tent, though of a larger quantity than before ; next turn your attention to the cavity of decay and pulp canal, and after a thorough cleansing with tepid water and alcohol, plug it carefully and effectually with cotton soaked in creosote and iodine, sealing the cavity itself up with cotton and sandrach varnish ; thus will terminate the second day's manipulation. Just at this juncture it will be well to suspend any further treat-

ment for a day or two, in order that nature may have an opportunity to assist you, as she surely will. Upon the third presentation, after again cleansing the canal, if your judgment approves, plug it solidly with cotton (very small pellets) in saturated os-artificial, and if the condition of the tooth will permit as regards tenderness, from which it *must* be wholly free, the cavity may be permanently filled with gold; continue the hypodermic injections with iodine exclusively every other day, (though if an obstinate case, a drop or two of carbolic acid may be occasionally added,) until you are unable to detect any pus whatever issuing from the fistula, when, with a gentle scraping with the point of your knife about the root and the circumference of the fistula, it may safely be left to care for itself. This mode of treatment, perhaps modified by the exercise of a matured judgment in special instances, is reasonably successful in accomplishing a cure, though of course that portion of the root which has been denuded of its periosteum will never again renew its life; but such is the tenacity with which nature adheres to a normal action that the tooth will prove a firm friend, rendering good service for many years; I am also inclined to believe that this denuded portion receives more or less nutriment from the proximity of healthy periosteum. I have now, although at some length, yet very briefly in comparison with what is required to do the subject ample justice, alluded to those diseases which are but the natural sequence to that decay in a tooth which, if neglected, inevitably terminates in the exposure of its pulp, followed by those lesions of which I have so imperfectly endeavored to treat. Another most prolific source of Facial Neuralgia is the malformation and unnatural development of the dens-sapientiae, or wisdom teeth (in the inferior maxilla, those in the superior being much less frequent in serious results). How frequently we are called upon to deal with one of them when its normal development forward is impeded, or wholly arrested, by the second molar lying directly in the abnormal course it has been forced to take, in consequence of lack of space for a natural growth, notwithstanding whatever barrier it may meet to its progress; yet nature demands that it shall develop, and if it is unable to do so in a forward direction, then it must do so in an opposite course, consequently we find a powerful reactionary pressure, which causes extensive inflammation of its periosteum, and in certain instances impinging upon the inferior maxillary nerve, creating an irritation of that nerve which results in the severest forms of Facial Neuralgia, with its attendant suffering; not only is this the case, but the muscles controlling the action of the lower maxil-

la become involved, and when this occurs a more or less firmly locked "jaw" is the inevitable sequence. Its direct pressure against the inferior second molar not at all infrequently terminates in a periosteal diseases of *that* tooth, which adds its complications to those previously mentioned, altogether forming a case of Facial Neuralgia more difficult to master than any other, where the lesion is apparent, that I am aware of. The remedy is to force open the locked jaws by means of instruments especially designed for the purposes, or in the absence of them by any methods which your ingenuity may devise. Wedges of wood are frequently used, also persistent packing of cotton between the teeth; having successfully accomplished this (all *force*, however, must be *exceedingly gradual* in its application), the next step will be to remove the offending tooth by means of the forceps, but as this in the majority of instances is simply impossible, owing to the fact that it cannot be reached, since it is buried in the tissues surrounding it, the only remaining remedy is to extract the second molar, when almost instant relief may be safely promised; proceed then by local applications to reduce the surrounding inflammation, and when opportunity occurs remove the wisdom tooth if deemed advisable. When these lesions of the wisdom teeth occur in the superior maxillary they are generally of a local character, and usually present themselves to us previous to their eruption; at this time they are readily and easily relieved by making a crucial incision with your lance of the gum, and applying tinct. capsicum freely to the wound. Perhaps the most perplexing causes from which Facial Neuralgia results may be found in Exostosis, and in the formation of granules of osteo dentine in the pulp cavity or canals, together with some rare cases of *complete ossification of the pulp itself*. It is needless for me, in view of what I have already written, to illustrate the method by which inflammation is induced in these instances. The extent of the neuralgic suffering resulting from such an origin is very great, and the lesion in the great majority of instances is markedly difficult to diagnose. In fact, it can only be done, when thus difficult, by the process of *exclusion*; the characteristics which present themselves to guide us are usually very similar to those of the periosteal diseases, and the natural inference to be drawn from them is the same; but to the great surprise, and sometimes the annoyance, of the confident operator, the disease shows no sign of abatement after the most exhaustive treatment for every form of disease which is familiar to him; *exclusion* of *them* then is in order, and he may safely diagnose his case as either one of Exostosis, or, the granu-

lar deposit of osteo dentine in connection with the pulp ; immediate extraction is the only remedy, but this does not necessarily involve the permanent loss of the tooth, since after carefully removing the irritant replantation may be resorted to with every promise of success, provided the operation is performed with intelligence and caution. The encroachment of salivary calculus, or tartar, upon the periosteum is also an exciting cause to many of the ills which our teeth seem heir to, and in the absence of other apparent reasons for the attendant suffering search carefully for such an irritant, and when discovered remove it thoroughly, when, if depending upon it, the pain will usually abate. I had hoped to have space to mention some of the other and less familiar originations of Facial Neuralgia, among them being the odontocetes, among which I have had the satisfaction of making several successful treatments, also the diseases of sympathy ; but my article has already assumed such extensive proportions that I must forbear alluding to them, and I will only add that when in connection with some of the difficult lesions which I have endeavored, however unsuccessfully, to illustrate, we are disposed to become discouraged and despondent, let us not forget that good old Latin maxim, “*Labor Omnia Vincit*,” and therefrom derive fresh courage to try again.

“*THAT VAGRANT.*”

MR. EDITOR : Like Betsy Trotwood, when the *donkeys* trespassed on the green before her cottage, so do I feel impelled to resent and drive away that London *vagrant* when he begins to nibble at the “*European Society of American Dentists*”—and like the aforesaid donkeys, this London correspondent seems impelled by some internal power, either of mischief, jealousy, or pure unreasonable prejudice, to trample on the position and the efforts of the American Dental Society of Europe. In his letter of January 17th, which has just come to hand in the March number of *JOHNSTONS’ DENTAL MISCELLANY*, he for the second time dignifies his first attack on the society as “*criticism*.” If such sneers and deprecations are considered as *criticisms* in London, they must have a different appreciation of the term from the American acceptance. If we should accept this apparent meaning, our newspapers would have occasional accounts like this: “*The Modocs criticised the inhabitants of Fort ——— on the 1st instant, carrying away four or five scalps of*

prominent citizens, etc., etc." In the January letter, your correspondent states that he sees "that the smiles of friends at home and the criticisms of vagrant are looked upon with rather more forbearance than previously." For whom does he speak, and what possible necessity is there or has there been for the forbearance of anybody, for the "smiles of friends at home"? When Dr. Eastlack writes an unofficial but social report of the meeting of the society to the *Pennsylvania Journal*, Vagrant must needs rush in on our green again and trample the grass down, claiming loudly that no matter what some may think, he is a "friend abroad." Vagrant cannot see "how the discussion of a few questions which have often been discussed before . . . is likely to raise the standard of dentistry" in one of the quarters of the world where, for instance, he happens to live—but any intelligent man from any quarter of the world can see in the few sentences that this Vagrant has devoted to the American Dental Society of Europe the *animus* of your correspondent toward the society. In his first attack, a Paris butcher was brought in as a subject for elevation; in this letter an "American dentist," with two addresses in America, is proposed as another subject—though it has been two or three times distinctly stated that the society is not missionary in character; otherwise its attention would be, as it is not, turned earnestly toward the conversion of this wanderer. In his reply to my answer to the first attack on our society, Vagrant cried "Abuse, abuse," and asked "where Mr. Wright would have found a peg on which to hang his abuse" if he had only known *who* it was, who, for purposes of his own, chose to sign himself "Vagrant." Ha! ha! If a gentleman chooses to put on the habiliments of a loafer and acts like a loafer and attacks Mr. Wright, Mr. Wright does not ask him for his card, and request him to receive "my friend," etc., etc. There would be no early morning meeting with pistols and coffee for two. On the contrary, Mr. Wright, though an advocate of peace and a warm friend of criticism (in the American sense), and a lover of gentlemanly brother dentists, and a mild man and a meek man, would do very much as the English on the continent do when they are insulted, *i. e.*, strike out from the shoulder. In almost every new society, or old one, too, for that matter, there is room for improvement, weak places that may be justly criticised, but Vagrant must see, and others who read his letters must see, that his remarks are not critical, and though I do not wish in any way to "gag the American press" (a very sly dodge, by the way, from Vagrant), I am astonished that a man who wields the pen so well on "questions which have often been discussed before" as can

this Vagrant, should also be so fond of throwing mud like an unwhipped cob. The slight tribute to the "well-known gentleman from New York," who was present at the meeting in Hamburg, though well deserved, is rather "too thin," if we may employ a slang expression. And though a little of the disposition of what we call "toady" and the English call "snob" struggled to the surface, the compliment itself was rather back-handed, for the "well-known gentleman from New York" accepted an honorary membership of the society. In a reply of this kind I would not stoop to recite *individual* instances of "English surgeon dentists," and "their tricks and their manners" on the continent. I do not wish to see a rivalry between *nations* in our profession. The cultivated dentist, or simply the conscientious dentist, who knows his faults and struggles for the higher standard of cultivation, of knowledge, of usefulness, has no country—as a dentist. His science and his art makes him cosmopolitan. Vagrants—and here is where the vagrant differs from the donkey, I am free to admit—have no rights that gentlemen are bound to respect.

C. M. WRIGHT, *Basel, Switzerland.*

DEMINERALIZED DENTINE.

By J. E. CRAVENS, Indianapolis, Ind.

In the *Dental Register*, October No., 1872, page 412, there was published a letter from me on the use, by dentists, of the Syrup of Lacto-Phosphate of Lime.

It was the first of the various epistles I have written upon this solution of bone phosphate, and in which I advocated the use of it internally as a tonic calculated to benefit patients suffering from an absence of the mineral constituents of tooth-bone proper. At that time the medical profession had just begun prescribing this syrup to such of their patients as were suffering from diseases causing a deficiency of the prime earthy element of the osseous system, or owing to which that condition was liable to eventuate.

In the letter referred to, I advocated the administration of the Syrup form of Lacto-Phosphate of Lime by dentists to patients whose teeth were manifestly deficient as to inorganic elements, be the cause whatsoever it might. It is my purpose here to furnish a few instances from my own practice in support of the views I then advanced, and to renew the advocacy of this character of tonic treatment.

It is not infrequently the case that a Miss of ten or twelve years, while presenting no symptoms of any particular disease, nevertheless painfully impresses the observer with her peculiar physical appearance. She is very thin and pale, while her movements are languid and indicate an absence of energy. She is weak at all times, her appetite is scant and fickle, whilst sleep is indulged in, or rather submitted to as a matter of duty, and is unrefreshing to her. The girl is, in fact, delicate, and there would seem to be an arrest of development generally, were it not that she grows, grows rapidly, too—not out, but up, like Jonah's gourd, so to speak.

This young lady is quite sure to find her way to the dentist. Should *he* know what practice to pursue with her peculiar case, the *thorns will disappear*, and her pathway to his office will be strewn with roses. If, to the contrary, the dentist falls short of the proper treatment of the patient's infirmity, her *teeth* will disappear, and the ugly thorns of regret and impaired digestion will hedge her earthly pilgrimage.

The teeth of this patient are of that bluish-white or pearl-starch complexion that the intelligent practitioner of dentistry dislikes so much to have placed under his care. Visibly the cavities are small, more or less numerous, and for the main part confined to the side teeth. A thorough examination with a small pointed excavator about the grinding surface lines of the molars, develops the wretched condition of them—*sous enamel*. The intercuspidal grooves that mark the junctions of the folds of original enamel membrane may appear to be defective to only the extent usual in those lines. But the deceptiveness of such teeth is revealed when the instrument passes directly through the enamel fissure into the body of the crown, and is revolved around and around, meeting with little or no opposition. The crown is a mere shell, a veritable whited sepulchre, and full of rottenness.

It is an easy matter to cave in the edges of the enamel fissure overhanging the cavern; and having done so, and removed the chips, we see—what? A tray of soft fibrous débris that emits a vile odor. The fibrous mass is demineralized dentine; the intertubular substance having been dissolved away, the cartilaginous tubuli have possibly enlarged, or their walls thickened from saturation, therefore the fibres. Particles of the softer food have been forced through the fissures by the opposing tooth or teeth in mastication; then the saliva having gained ingress a partial digestion ensues; the natural heat of the parts soon induces a sort of garbage fermentation—decomposition—hence the odor.

The character of dental caries in such cases is that known as the *soft*

white. Under the soft or fibrous mass the dentine has at first a cheese-like consistency, and is usually exasperatingly sensitive, although the density improves as the excavator advances. When the instrument uncovers dentine that has not been subjected to the action of the contents of the cavity of caries, it will be noticed that the cartilaginous or organic element predominates in the ivory structure, and that an exalted sensibility still prevails, and the verdict is necessarily *demineralization*.

It is not my intention to give herein my views of the proper *topical* treatment of a tooth affected as above described, because, hypothetically, if one tooth has suffered from a general structural loss of inorganic constituents, all the teeth in that mouth have experienced the same character of inanition, and probably to a corresponding degree.

In 1872 a girl of 12 years was brought to my office for treatment of her teeth. She was of the description I have just given; indeed it has been my aim to illustrate, with a pen-picture of this young lady, that peculiar physical debility and dentinal starvation, the systemic treatment of which I hope to elucidate in this paper. This girl did not obtain puberty until two years after my treatment, so that her peculiar physical frailness could hardly be attributed to the approaching first change in female life. When she was placed under my charge she had then been suffering four years from the debility and weakness described, during which time she had been under homœopathic treatment, but had failed to obtain any relief. I directed her to take pulverulent phosphate of lime, two tea-spoonfuls daily, one morning and one evening. In about a week she called to say that the powder was becoming disagreeable to her, and requested that the number or size of daily doses be diminished. I told her to take thereafter one spoonful a day and that in the morning. In one week more her father called to say that his daughter could not swallow the powder at all, and that she declared she could even smell it, her aversion to it having gradually increased from the outset, so that finally the sight of it caused a sickening revulsion. On examining the powder she had, I found nothing wrong about it. It was white, clear and odorless; so that I was induced to think that her stomach having been unable to digest the powder, phosphate of lime, the repeated introduction of it into the gastric cavity superinduced a dyspeptic, morbid mental impression that was immediately aggravated through the sense of sight. The action on the olfactory nerve was imaginary, and probably owing to the peculiar sympathy existing between the special senses of sight, taste and smell. I directed a discontinuance of the powder that in two weeks had become so obnoxious to the patient.

About this time I read M. Locke's report of the successful experiments in certain French hospitals, with lacto-phosphate of lime, the phosphate having been predigested in lactic acid, and then prepared with a syrup vehicle to be administered to patients.

The marvelous beneficial effects of this lacto solution of bone phosphate were obtained through the stomach, and therefore the pabulum must have been generally distributed throughout the osseous structures of the body; even the teeth were not debarred from the gracious banquet. Imagine the pleasure of Quartermaster Pulp upon receiving such wholesome supplies for distribution to his hungry little regiment.

When I read the wonders detailed in M. Locke's article, I hoped I had at last found the desired remedy for the troubles of my young patient. At my suggestion her father procured four ounces of the syrup, and gave it her in dessert-spoon doses, three times per diem, before or after meals; the doses were after a time reduced to two, and finally to one spoonful daily.

From the first of this syrup treatment the girl began to improve. Her appetite increased rapidly and permanently, her cheeks began to show some color, whilst her eyes brightened and her spirits became light and joyous. Strength and roundness returned to her frame, that had formerly been languid, weak and wasted.

When the first supply of this tonic was exhausted her parents renewed it; the patient continued to improve in every respect, so that the mother thought to make an extended visit, accompanied by her daughter, to Massachusetts, where the family formerly resided. The mother had not been able to revisit the scenes of her earlier life since moving west, several years before, because the feeble health of her daughter would not admit of it. Before starting upon their journey the mother and daughter called at my office, that I might see the wonderfully improved condition of the young lady—to have her teeth examined, and any temporary stoppings renewed that were needed—to show me a fresh supply of the lacto-phosphate of lime, purchased to "tide" the patient over the proposed absence, and to say "good by" for about four months.

About the end of the allotted time the patient returned, and soon visited my office. Her general rotundity was certainly delightful to those who had known and pitied the emaciated, fading flower of but a few months previous. Her formerly thin face was round and rosy, and her efforts to shape her mouth into a broad smile soon ended in a well-marked dimple in either cheek. I freely confess that the great physical

improvement of the patient under the syrup tonic was not contemplated by me at the outset, and my astonishment was fully equal to that of the parents. I did not say this to them, however, but received their expressions of gratitude in dignified silence.

But to return to the consideration of the effects of this treatment upon the patient's teeth. When placed under my charge the extreme sensitiveness and softness of the dentine prevented me from introducing more than two or three gold fillings, so that I stopped the remaining cavities temporarily, to await the good effects hoped from the lacto-phosphate of lime. Some of these temporary fillings came out, and some I removed at various times, affording me ample opportunity to note any changes in sensibility of the dentine. Very soon an improvement in this respect was noticeable, becoming gradually more marked until the patient left on the four months' visit east. After her return I found the sensitiveness of dentine had subsided to a normal state, and I removed most of the temporary stoppings and refilled with gold. The patient said she felt no aversion toward the syrup from first to last, but on the contrary she rather liked it because it tasted like gooseberry juice and sugar. I must dismiss this patient.

In the early fall of 1871, Mrs. ———, a lady of twenty-six years, being pregnant, I persuaded her to an experiment course with phosphate of lime, so that in early gestation she began taking the powder, one or two tea-spoons of it daily. This she practiced faithfully until about the sixth month, when I substituted the syrup of lacto-phosphate of lime. During the time that she was taking the dry phosphate she was plump, rosy-cheeked and strong; no nausea, no headaches or back-aches; her appetite was generally good, and she never felt averse to swallowing the powder. When she began, at the sixth or seventh month, to take the syrup, her appetite increased rapidly until she ate ravenously. She said she really was always hungry, but had to stop eating occasionally, for politeness' sake, and a due regard for her husband's exchequer. She felt perfectly well until labor claimed her place; the pains were of short duration, and the child was a boy of ten pounds; he was a lusty-voiced little fellow, and his flesh remarkably solid, feeling and looking like that of a child several months old. This boy is now nearly four years old, large, and unusually strong for the age, and a picture of health. He has a full set of deciduous teeth, good, strong and regular, with plenty of room in the jaws. The mother has given birth to another boy since then; the weight at birth was also ten pounds; but the child's flesh was softer, and he was not so vigorous as his elder

brother. The same difference obtains between these boys to-day, for, although the younger one is about two years old, he looks like a delicate little girl, his skin is very clear and white, his voice more like a girl's than a boy's, his stature small, and whilst apparently fleshy, his weight is deceptively light. During the second gestatory period, the mother had received no phosphate of lime, except as it was derived from food; her appetite was good enough perhaps under the circumstances, but she was much troubled with headache, pains in the lumbosacral region, and an occasional sense of nausea.

Whilst pregnant with the first child, and during the succeeding lactation, the mother experienced no unusual trouble from her teeth, and having been called upon during this time to introduce one or two fillings, I took care to notice the condition of the dentine, and found no unusual sensibility there.

The second gestation and ensuing lactation, however, afforded quite a diverse report. Shortly after this second impregnation, the lady's teeth began to trouble her; they continually broke away in bits, and were painfully susceptible to thermal changes. Withal, her nervousness so increased that she could not endure a dental operation at all, even though it were painless. After her babe had been weaned she was again strong enough to take her place in my operating chair, but her dental apparatus was hopelessly wrecked. The deduction in the case of this mother and her two boys is that the demand of the foetal development upon the mother's system was too great for her to fulfill, unless her own self were helped to an additional supply from external sources, and in greater abundance than was afforded by ordinary alimentation. In the case of the first gestation the mother received an abundance of the bone phosphate, and was accordingly enabled to give of her store sufficient to develop strong bones and muscular fibres in the foetus, without suffering any appreciable loss in her own osseous system. But in the second gestatory period how different were the results. The life intrauterine was developed at the expense of the tissues of the mother. The food she ate did not supply the requisite phosphate of lime, so that her bones could spare but little to the foetal development. Nevertheless, the bones—teeth and all—were robbed to the up-building of the little stranger, and for want of the external resources from which to obtain the needed pabulum remained, robbed and softened, until lactation ceased, and the babe no longer derived nourishment from the mother.

In June, 1872, a Mrs. —, about thirty years of age, came to me

for dental services ; the complaint of a general toothache, located nowhere in particular, the mouth mirror disclosed the presence of quite a large number of carious cavities ; several amalgam fillings damaged and leaking, and a few gold fillings in the same condition. Soft white dental caries was prevalent in nearly all cavities. The anterior teeth of either jaw had small cavities in labial surface at the gum line ; the inferior molars had buccal cavities in them, along the gum ; whilst there were proximal cavities all about the superior dental arch. All the grinding surfaces of the molars were carious. The dentine was softer and more sensitive than usual, and after a week or two grew so rapidly worse, that coupled with the increasing nervousness of the patient, I found it necessary to cease operations until some systemic means of relief could be brought to bear upon the case. She gave me to understand that she was in the seventh month of pregnancy and said dental operations must be hastened. I told her I wished her to take syrup of lacto-phosphate of lime for a few weeks—at least until she felt better able to submit to the operations on her teeth ; and that she should consult her family physician, and obtain his consent and prescription for the syrup, in case he had no objections to her taking it. The physician consented, and directed her to take three dessert-spoonfuls daily for two weeks or more, which she did pretty closely. Her nervous dread of the operations disappeared in about two weeks, so that she returned to resume the sittings. The effect of the lacto-phosphate upon the dentine was excellent, although the time was so short, the sensitiveness being hardly greater than normal. After a few more days of short sittings, the weather became suddenly so hot and prostrating that the lady could not muster enough energy to come to my office ; the excessive heat continued for several weeks, after which time the patient was so near confinement that we were apprehensive of serious trouble and so determined to attempt nothing further at present.

I report only the foregoing cases because they are marked instances of the beneficial effects to be obtained from tonic treatment of our patients with lacto-phosphate of lime in cases where for any reason the teeth are deficient in mineral constituents. I have prescribed this syrup in many cases with good effects from the use of it, and I believe that if the profession would oftener resort to this manner of dealing with subjects afflicted with general dentinal hyperæsthesia, previous to or during numerous painful operations, and where soft white dental caries prevails, they would find their operations more satisfactory to themselves, would benefit humanity, and receive the heartfelt gratitude of their patients. —*From Missouri Dental Journal.*

MEETING OF THE DENTAL SOCIETY OF THE FIRST JUDICIAL DISTRICT OF THE STATE OF NEW YORK.

HELD AT THE RESIDENCE OF DR. CHARLES E. LATIMER, TUESDAY
EVENING, MARCH 7TH, 1876.

Subject for discussion—"Manner of inserting fillings in the teeth, and the principles involved in the operation."

The meeting was called to order by the President, and the minutes of the last meeting read and approved.

The report of the clinic committee was made by Dr. Atkinson, who reported 70 members in attendance.

Dr. Palmer opened the discussion of the evening, exhibiting a diagram showing the method of cutting and building up the teeth.

Dr. Perry said the subject was altogether too large, and it is not possible to say what should be said, and in such a manner as to be clearly understood. My method of filling teeth is rather a broad one—in fact, I have no method, and have in my case instruments that are adapted for soft gold, sharp points—diamond points as they are called. I have also the serrated points, and I have also Dr. Atkinson's smooth points. I think it unwise to have any fixed method of operating that must be applied to every case. I often restore the contour; I do not do it, however, with cohesive gold, but I use soft gold. I use cohesive gold, of course, sometimes, slightly cohesive, just enough to make it stay where I put it, and very often as cohesive as I can get it, using No. 4 probably more than any other kind. In that way I can get a more solid condition than I have been able to by any other method whatever. However, for most work I use soft gold, but it won't pay to use soft gold to the exclusion of cohesive gold. Just when to restore, and when not to restore, is a very important subject. I sometimes hesitate a long time before determining what to do—whether to separate or not. If I make spaces at all between the teeth, I do it most where it will not close up again, and I feel better satisfied to have it open, provided it can be protected as much as possible. I am not in the habit of attempting to restore the shapes of the teeth where there is no natural surface to build on. It is just as well to build it up only on the side, and it is just as satisfactory.

Dr. Jarvis: What I would say has been included in what Dr. Perry

has said. I try to be eclectic in the various kinds of instruments and material and preparations of gold. And yet perhaps it would be better to be more nearly confined to a smaller range, for what we are thoroughly accustomed to using we can use to better advantage. For a mallet, the automatic is my dependence, with variations. For gold, I use more of No. 6 foil than anything else, but still eclectic. But my study at this particular hour is the principles involved in filling a tooth. Take, for example, a cup-shaped cavity, quite uniform in outline, and we find great difficulty to anchor the filling. Holding the first gold at *one* point will not answer, but it must be held at *two* points, so as to secure a *line* in connection with the wall. A bifurcated holding instrument, or its equivalent, will secure this condition and prevent the gold from drawing up and rocking.

Dr. Wm. H. Allen said: I will begin just where Dr. Jarvis left off. In the first place, I should never attempt to fill such a cavity as the doctor describes, for the reason that when I put in a filling I want it to stay. In such a cavity I would either make opposing retaining pits or grooves, or put in a screw; then if the first piece of gold would not stay of itself, I would hold it until I had built the gold across the cavity from one retaining groove to the other. After that it is a simple thing to add gold to that which is already made fast, until the cavity is full. Without retaining pits a cup-shaped cavity is not likely to hold the filling long enough to give satisfaction to either patient or operator.

There are a good many principles involved in the proper filling of teeth, and one of them is, that the cavity shall be of a proper shape to retain the filling.

The great principle of all is the perfect adaptation of everything connected with the operation to the desired result, viz., the preservation of the teeth. There should be perfect adaptation of the mental and physical capacity of the dentist to the work in hand; perfect adaptation of the temperament and temper of the operator to the patient; perfect adaptation of the appliances, instruments and material to the particular case in which they are to be used.

A dentist should be temperate in all things, and endeavor to keep his physical and mental powers all in the very best condition, that he may be able to adapt them to the needs of his patients; he should be able to govern and control his own feelings and actions and those of his patients also.

In materials for filling teeth we have only about five different kinds and their varieties, that are good for anything, and some of these are not good for much except for temporary use.

We have gold, amalgam, tin, oxychloride of zinc and gutta-percha, all good in their places, and we must use our judgment to determine the proper time and place for each or either of them. Gold, as a general thing, is the best, but it is not always the best.

I would like to tell you how I fill a tooth, but it is difficult to do so without being able to demonstrate it. I could show you my manner of filling a tooth much better than I can state it. However, I will try. Let us take, for instance, a proximal cavity in an upper bicuspid; a large cavity. In the first place, I should cut off the edges of this cavity until I came to thick, strong enamel, then remove all decay, being particularly careful to leave no partly disintegrated enamel in those parts, sometimes nearly or quite out of sight, near the gum. I would then shape the cavity properly to retain the plug, undercutting the opposing sides enough to answer the purpose without weakening the tooth more than is absolutely necessary. I would cut the cervical edge of the cavity, as a general thing, flat, or at right angles with the side of the tooth. Very often when the cavity extends up nearly to the gum there will be a little of the enamel left there, and if you have the cavity undercut at that point, that little enamel which is left, being very thin and diamond-shaped, will, when forcing the gold into the undercut, split off, the split running up under the gum some distance. This imperfection cannot be repaired and the tooth will most likely begin to decay at that point very soon.

In selecting gold to fill such a cavity I choose that which has a peculiar, glove-like feeling. It is soft and still cohesive, and I use pretty good sized pellets. Having a small retaining pit at the cervico-palatine corner of the cavity, I commence my filling at this point, adding piece after piece until it extends across the cervical to the labial portion of the cavity, where there should be a slight undercut, sufficient to retain the gold already placed in its position, where it should be malletted as solid as possible. From this strong flooring of gold the plug can be built in any direction desired. Particular care should be taken to fill the undercuts (which should not be abrupt) full and solid, and to cover all portions of the dentine, and strengthen any thin or weak portion of enamel by building the gold over it, so that when all is done there shall be nothing exposed but solid gold and strong enamel. A large cavity like this will usually extend into the crown fissures, and building gradually down until I reach this part of the tooth I finish the plug at this point, burnishing the whole plug with strong hand burnishers from the centre of the same towards the enamel. In finishing such a plug, great care

should be taken to have that part near the gum perfectly solid and smooth ; the gold must be left perfectly even with the surrounding portions of the tooth, that there may be no shoulders for the retention of food, which would soon cause fresh decay. If you would have your operations considered first-class, you cannot take too much care in finishing them perfectly. In carrying the gold over a thin edge of enamel, do not extend it over the whole distance at once, but beginning at the strong portion of the tooth lap each succeeding piece of gold a little further than the last, until the whole edge is covered. By this method there is little danger of breaking the tooth, and some certainty of making the filling solid, even over the thinnest enamel.

Dr. Atkinson said : I will simply repeat the same old story. Properly form your cavity, so that the gold may have a good hold on the teeth, and then so apply your gold as to hug and strengthen the walls and restore the teeth according to circumstances. If men understand what a cusp is to be restored for, they cannot but restore it. It is so as to get each tooth on its own basis, to perform its part of the mastication that it is requisite for it to perform, by the proper building up of the tooth.

Dr. John Allen : During my practice a variety of methods have been introduced. If a cavity is presented, I endeavor to procure good retaining points. If two are not sufficient I make four, but be sure and get the cavity in such a shape that when the gold is put in it will stay there. Let the points used for that purpose be of such a shape that they will place the gold and carry it home to the best advantage, whether they be round, or serrated. I can look back to-day and see some fillings that I have inserted 30 or 40 years ago, and they have been held there by an instrument as a general rule, but I can only say that I have more confidence in the fingers of my own hand than any of the instruments that I have seen. I feel more at home when I am at my work with my fingers than I do with the modern methods that are so highly commended. But the great point is, to see what the nature of the case requires, and then work accordingly. As has been said, I know of no one rule that will hold good or the best in all cases. Some cases require one thing and some another, and consequently it requires *brains* ; as an eminent painter has said, he always mixes brains with his colors, so we should mix brains with our work.

Dr. Hurd said : In making oxychloride filling, I first prepare my cavity by getting it perfectly dry, then I mix my oxychloride quite thick and apply it to the cavity with creosote.

Dr. C. E. Francis : The first principle in filling teeth is to thoroughly seal the cavity to prevent it from decay. The best sealed cavity contains the best filling. The next principle is to give the teeth as much of a contour appearance as their safety will admit. A great many contour fillings are not safe, as too much surface is exposed. The next principle is to use the material best adapted to each particular case, taking into consideration the position of the cavities, texture of the structure, and all that. Although gold, as a rule, appears to be the best filling material, yet it is not the best filling in all cases. The next principle is in the preparation of the cavity. You cannot be too particular in this respect.

Dr. Thos. S. Burrows : I have been surprised at the success of the oxychloride, and now I have got so I have used it with a great deal of interest and a great deal of success. Not long since I found some teeth that had been filled with cement, and removed them with a great deal of difficulty, and put in the oxychloride of zinc filling. I am not confined to any particular filling.

Dr. Hoyt : I do not confine myself to any rules in filling teeth, but take the liberty of using my own judgment entirely. I use sometimes amalgam, sometimes cohesive gold, and sometimes oxychloride of zinc. If a cavity is very sensitive and the nerve exposed, or nearly so, I do not attempt to pack any filling in there, but I take a little plaster that will set very quickly, and put it over the sensitive point and fill the cavity full ; and a couple of days after, if the cavity is comfortable, I excavate the plaster, leaving a very small portion over the sensitive or exposed point, if I am not confident that I can fill it without touching that exposed point.

Dr. J. B. Littig : It is not the teeth that have to be restored that trouble me the most, but where there are small cavities and you have to wedge the teeth apart to fill them. If you allow them to come together again they are very apt to decay—at least I find it so in my practice. Where a tooth is very much decayed, I believe it to be the best plan to restore it, but where the proximate surfaces are small, as in front teeth, I cut away. In the side teeth, from the bicuspid back, I try to close the space as well as I can if the teeth are very much decayed by putting in contour fillings, but if not I would rather leave a space between the teeth than to let them come together, because my experience so far shows me that they last better so than they do if I let them go together again.

For a year or two I have resorted to a method of practice in the case

of pulpless temporary teeth which was used some years back in teeth of adults, viz., that of boring in at the free margin of the gum, and then filling the crown with some soft material, leaving a free opening into the pulp chamber at the neck of the tooth. I find this plan very satisfactory.

Dr. A. C. Hawes : I believe there is a great deal of unnecessary labor bestowed upon proximate cavities in the central and lateral incisors by wedging and forcing apart previous to filling. A simple V-shaped separation from the lingual surface facilitates the operation and secures the safety of the teeth, when properly filled, which can very readily be accomplished by the use of the mouth mirror.

Dr. Ford said he sometimes used gutta-percha for filling teeth, but generally where there will be no pressure.

Dr. Emmons : Gutta-percha will shrink when using it over the cervical. Take, for instance, the right superior and bicuspid, with a gutta-percha filling, and retain it nicely in position at those two points. I find them give out always at the cervical wall. I should make my retaining point in the centre of the bicuspid, as you are not so liable to expose the pulp. In some teeth I would cut the walls perpendicularly, and make one point about the centre of the tooth, and I have found that would not expose the pulp. There is no necessity for making but just enough retaining point to hold, and you do not need more than one point, provided neither of the walls are broken away.

Dr. Boedecker : I believe amalgam is just as good in every way as a gold filling. You keep it perfectly dry, and wash the amalgam and squeeze it out hard, and then afterwards put tin or gold foil over it, and burnish and polish it just as a gold filling, and I think it will, in some cases, do just as well as a gold filling.

Dr. Harris : When I am called to fill teeth, I think the first principle is diagnosis, to decide the quality of the teeth, the structure that I am to work on, and next the *come-at-ability*, if you choose. If I have a strong tooth structure in the mouth which I am to operate on, and I find from observation that the nerves are dead, in such a case I should restore their contour. Now, if I find a tooth in the posterior part of the mouth, where the come-at-ability is so utterly impossible that by past experience and past failures I know that it is beyond my power to insert a gold filling in that tooth, I put in an amalgam filling as the next best filling. In my judgment there are but three fillings that I call permanent fillings, and those are gold, tin foil and amalgam, each best in its proper place. I have made careful observations during the last five or six years, and I find decay and signs of decay along the line of

contact between the central incisors. I find the left lateral underlap the left central, and I find the cavities decayed. Now, from the peculiar development and the peculiar shape of the eye-teeth, I have a space here where there has never been any decay. I find no decay in that structure. Now I pass on further in the mouth, and I find, by the peculiar development of the first and second bicuspid, that they either do not touch at all, or open larger on the surfaces towards the teeth. Now I pass to the right. There I find the bicuspid in a state of decay. Experience has taught me that if I fill those teeth and let them come back together, they have to be filled in the most perfect manner. Experience teaches me that to be eclectic is the only true principle. That man who is the clearest in diagnosis, to know what is the best to do, is the man that will have the most happy results.

Dr. Wm. Carr: My experience with gutta-percha filling has been that it expands. I have seen gold fillings applied by good operators which would remain there for ten or fifteen years, and have seen bicuspid actually split by the expansion of gutta-percha fillings. That is one reason why I never use it. That has been my experience.

Subject for next meeting—Treatment of Proximal Surfaces.

Next meeting to be held at the residence of Dr. Atkinson.

[In the report of the meeting preceding this, Dr. Hawes' remarks were entirely concerning filling children's teeth, which was not made clear by our reporter.—ED.]

VOLUMETRIC ESTIMATION OF ALCOHOL.

By T. T. MONELL.

When a salt of cobalt is added to an alcoholic solution of sulphocyanide of ammonium an intense blue color is produced. This color rapidly disappears on the addition of water and returns on the addition of alcohol. The same percentage of alcohol and volume of liquid, with the same amount of standard blue solution, always has exactly the same intensity of color, in whatever order the alcohol and water are added.

It is possible to rapidly determine volumetrically, to about one-quarter per cent., the quantity of alcohol in mixtures by this reaction. If we put into a large mixing cylinder a measured quantity of the dark standard blue solution, and pour upon it the mixture to be tested until the tint matches that of a strip of very pale blue glass, the volume of liquid so tinted will be greater as the mixture is stronger in alcohol.

These volumes once determined would always hold good, and the per cents., being marked upon the cylinder, could be read at once. The standard blue should always be made with alcohol of the same strength, and standardized by the same strip of blue glass used in the actual analysis.

Nitrate of cobalt is very suitable to produce the color, which appears to be very permanent.

Colored whisky or brandy can be directly tested in this way, but the color is of course green, so that two cylinders containing the sample must be used—one for the dilution, and one to place in front of the strip of glass to give it the same color.

This blue coloration is often a more delicate and convenient test for cobalt than Schön's similar test. For this use, the cobalt solution may be neutral, or slightly acid, and should contain as little water as possible.—*American Chemist*.

CANFIELD MINERAL DRESSER.

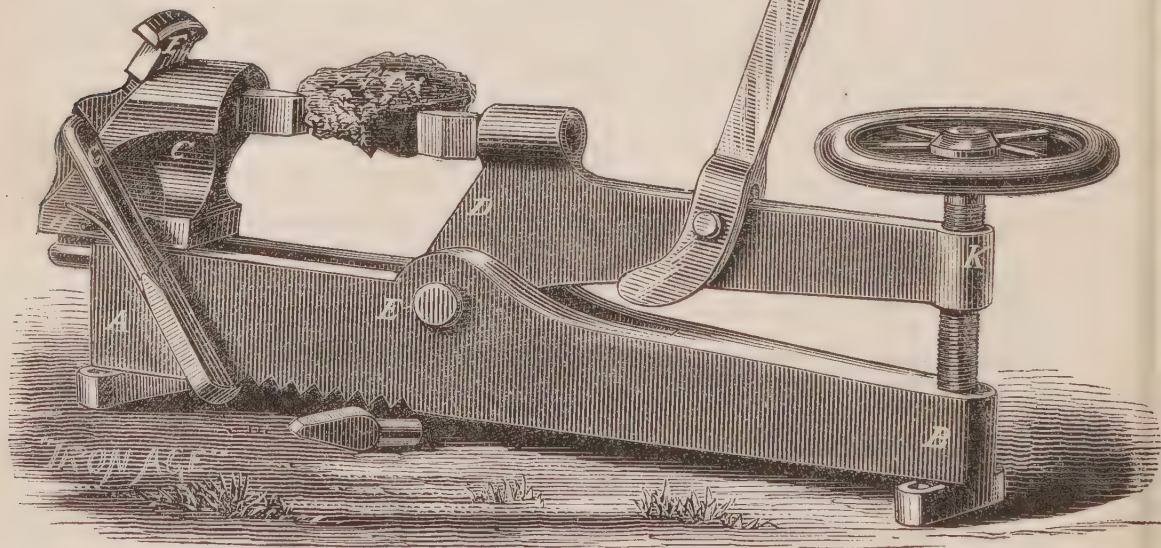
By T. EGGLESTON, Ph. D.

The mineral dresser, invented by Mr. F. A. Canfield, of Dover, N. J., is composed of a bed plate A B made of cast iron, which is planed and slotted at one end to receive a movable head C, and is slightly tapered at the other to allow of greater motion of the head D round the pin E. The head C is made of cast iron, and is planed to fit the slot in the bed plate. On its side there is a projection fitted with a half circular hole for receiving the clamp G, which holds it in place when adjusted. The head D is made entirely of wrought iron. It is bulged slightly at one extremity to secure the steel screw K, which is moved by a hand wheel, and has a very slow motion.

The heads C and D are bored out, tapering to secure the cutting chisels, which may be made of any shape, so that the action of the machine may be made to be either that of a chisel or that of the shears. To use the machine the sliding head C is freed. This is done by removing the steel wedge F which holds the steel clamp G in position. This clamp fits into notches in the under side of the bed plate and into the circular slot in the back of the head C, and is kept from falling by the brass spring H. The specimen to be operated upon is placed between the two chisels, the screw K having been previously run down

so that the chisel of the head D is slightly above that of the head C. The chisels are then turned at any angle so as to suit the specimen, and the movable head run up against the specimen. The clamp G is then secured by the wedge F. As the specimen is not tight between the chisels, it is held in the hand while the head C is being fastened. The screw K is then slowly turned; this causes the chisel of the head D to advance slightly. The two cutting surfaces being exactly opposite each other, the hardest rock will soon yield under the pressure, and will almost invariably be cut off square. If one hand is kept on the specimen when the cutting takes place, it will be found that there is a slight jar at the moment the specimen is cut, but not sufficient to detach the most delicate crystals. Specimens containing very fragile crystals on both sides of a very hard rock have been cut in two, thus giving two specimens, when a single stroke of the hammer would have destroyed most of the crystals on both sides of the specimen. Since the introduction of this machine in November last the hammers and chisels of the School of Mines have been consigned to a drawer, as there is rarely occasion to use them, and we no longer fear to trim a specimen of any size, no matter how hard the rock or how delicate the crystals.

When the machine is to be used on soft rocks



or in trimming fossils it is provided with a lever arm L, which straddles the long arm of the head D, and is fastened by means of a pin, which can easily be removed when the arm is not wanted. To use it the screw K is turned up so that the long arm of the head D rests on the bed plate, the head C is then adjusted, and by a series of quick move-

ments toward the specimen the instrument is made to detach the rock. By changing the form of the chisel the two cutting surfaces may be made to act like shears, so as to cut specimens of shale exactly without breaking them. This instrument is invaluable to collectors of minerals and fossils, as it allows of the greatest precision in preparing specimens for the cabinet, since it is no longer necessary to dress a large quantity of superfluous rock for the sake of preserving a few crystals on it. To suit the varying shapes of specimens, chisels of any shape or size can be made to fit the heads. It has been found, however, that three shapes are all that is necessary. The chisel shape with a bevel edge like the drawing, the pyramid and the shear. It is sometimes desirable to vary the length of the cutting edges, but generally one inch is found to be sufficient for all ordinary cases. The expense of the instrument is not large, and it will earn its cost to a collector in a very few weeks.

[The above is from the *Iron Age*, to which we are also indebted for the cut.—ED.]

ON THE DISCOVERIES AND PHILOSOPHY OF LIEBIG.

WITH ESPECIAL REFERENCE TO THEIR INFLUENCE UPON THE ADVANCEMENT OF ARTS, MANUFACTURES AND COMMERCE.

By T. L. W. THUDICHUM, M.D.

Introduction—General Sketch of Life and Labors.

The science of the present age is distinguishable from the learning of past ages by many important features. By these it has indeed somewhat altered the sense originally attributable to its name, and science has become a word of greater precision, and therefore of a less broad significance than what may be termed mere knowledge. This is so little understood, that when lately a great statesman and orator met some of his constituents in a south-eastern suburb of this metropolis, he informed them, amongst other things, that science was merely another term for knowledge. Even if it had been so originally, and the Latin word *scientia* had been merely the equivalent of the Saxon word knowledge, it would have to be admitted that the relations have changed by one of those conventions which are silent and convenient. We hold that the systematic enunciation of mere knowledge is doctrine; that science is a kind of knowledge, but that not all knowledge is science. Science is

that kind of knowledge the correctness and truth of which can be proved by evidence convincing to all healthy understandings. Science is a series of potentialized axioms which, when once mastered, are as evident as the simple axioms in mathematics, which are said to be so self-evident as to require no proof. By this definition a very large amount of human knowledge or doctrine is at once excluded from the domain of science. The learning of past ages was mainly imitative, little observant of new phenomena. Those ages had too much work on hand, first, in the development of their languages, in which they used imitations countless in number; next, in the shape of securing the conditions of social life in the form of communities and states. But even when these may be said to have been secured, *e. g.*, at the height of power of the Roman Empire, science was not developed, and it may be said that this absence of scientific treatment of the common problems of life has been one of the principal causes of the downfall of that, and of many other States. Famines, epidemics, amongst men and cattle, and wars, are made possible or necessary only by the absence or faulty application of the principles taught by science. Science, by teaching that, and how these evils are to be avoided, has a field in this generation of which the past had not even a distant conception. Imitative learning shows itself mainly as art, buildings, sculptures, paintings; all the mass of temples and gods, which fill the world's history and imagination, are of this kind. There is no science about a Greek or Egyptian temple, simply because there is no value in it; it does not satisfy, to our present mode of thinking, one single demand of the understanding. There is no science about our present homes, or how could they get filled with sewer gas, be devoid of arrangements for ventilation, and have square chimneys? Architecture, so called, is not a science, but an imitative art, beautiful but blundering. Manufactures have, too often, been carried on with great disregard of science, with the result that either empiricism was, for the time, successful enough, or that the manufacture went simply out of existence. It is the same with commerce. These arts have worked by tradition, by prescription, by precedent. They all wait for an infusion of the scientific method, the method of principle based upon natural laws, immutable and indestructible. While not often scientific themselves, these branches of human knowledge, administering all the time for a consideration of gain to be paid by the recipient to important human wants, have yet indirectly advanced science by either finding and bringing, or by producing some of its materials.

Antiquity, then, possessed no science, except alone the results of meditation, which have been termed metaphysics, and which, if allowed to include ethics and logic, have no doubt attained in the treatment of philosophers a high degree of development. The contemplation of nature, however, in its inorganic and organized shape, and of the causes determining all motion and development, was not greatly developed. The power of distinction, the mother of all knowledge, was not applied to all things, and consequently they termed a process, such as fire, an element, and allowed some all-pervading material to exist under the name of the quintessence. Bodies fell to the ground because they possessed weight; but that the falling was a reciprocal action between the earth and the body falling upon it, escaped their observation, and was only found by science.

Mere observation is not science, but only the beginning of science. When a person sitting in a railway train beholds the traveling shadow, he makes an observation. He begins a scientific inquiry when he asks whether the shadow travels as quickly as the train, so as to be in a line falling from the sun past the train, or whether the shadow is not a little later. If once the question has arisen, it is immaterial where it is solved, whether upon the railway train or the satellites of Jupiter—the question must lead to the idea that light requires time for traveling; exact science determines this time by measuring space. Science began its development with the elucidation of celestial phenomena, and became astronomy, or the doctrine of the laws according to which heavenly bodies move. Copernicus is from this point of view the father, the creator of science. Kepler, Galileo and Newton reduced the observations of these phenomena to expressions of regularity which we call laws. The method once found was applied to other branches of knowledge; then arose the physiology of the animal and vegetable world, based upon anatomy as a science. Harvey made physiology a science, and so on in all branches of knowledge.

Now, let us see what was the method by which these results were obtained. Meditation had, of course, the inciting share, but furnished no materials. Observation accumulated the materials of which reflection might weave a tissue, the test was experiment. If from a knowledge of conditions a result can be predicted, then there is certainty. Such certainty is science; it consists of observation, meditation, knowledge of conditions, knowledge of their results, and therefore of the connection between results and causes; these being regular, immutable, within the time accessible to our perceptions, and coercing everything under their sway, are called natural laws.

Of science, it is allowed that no part comes out of the human brain alone, not even the ideas of God and Immortality, which Kant claimed as innate ideas, while allowing all others to be the result of observation and reflection. The celebrated joke, that if an Englishman and a German were asked to produce a camel each, the Teuton would evolve one out of his inner consciousness, while the Briton would produce a camel of flesh and bone, is a good satire upon innate ideas. Science did not progress until it rejected all innate ideas or phantasies, and applied itself deeply to its proper methods, to observation, to meditation on the correlation of forces, and to experiment. Work, work, and again work, were the three main features of its success. The search for the philosopher's stone, for the medicine that should make you young, healthy, happy and rich, was also work, enormous in amount and extension, but it was not based upon observation. It left results which science gathered, the main result being that we cannot prolong our lives forward, but we can, as Kopp has beautifully said, prolong them backwards indefinitely, and see the changes of enormous spaces of time pass before our admiring eyes and minds.

There are three kinds of history : that of our planetary system in the theory of Laplace, that of our earth in geology, that of living things in the theory of Darwin. No serious person doubts now that the teachings of geology deserve the title of an exact science, and that compared to its coercing character upon the mind of man the convictions derived from written history are feeble in the extreme, and all contradictory writings, however old, mere nullities. The youngest of the sciences or branch of science is chemistry, founded by Lavoisier and Dalton ; developed by thousands of clear heads and nimble hands, it has in half a century become a recognized power in the affairs of man. It has materially improved his estate, and enlarged his mind to conceptions of an elevating nature ; it has become a ready test of his reasoning and working power. It has become the handmaid of almost all the elder sisters of astronomy, teaching the composition of distant stars ; of geology, teaching the composition and changes of strata and minerals ; of physiology, vegetable and animal, teaching about food, nutrition, growth, changes, death and decay ; of the healing art, teaching the nature of evils in the shape of disease, and the means of curing or mitigating them. This science, too, was developed by work, work, work—physical and mental ; its ways were often rugged ; its endeavors misapprehended, opposed, suppressed. And the great men whose names are inscribed upon the roll of its principal promoters will be considered

by posterity as benefactors akin to Hercules, removing evils, establishing the good and true. If we cannot now inscribe their names and likenesses amongst the stars, and transfer them to an Olympian abode, yet we can honor them by admiring their works and lessons, by sharing and continuing their work, by, as it were, living their lives with them over again, and thus prolong their memory forwards, while we prolong our own in the inverse direction. We ought to honor them out of gratitude no less than out of the desire to benefit continuously man's estate. Such feelings have been instrumental in the cases of those who described the greatness of your Davy, of your Farady. Such feelings shall now be the guiding principle in the consideration of the life, works and philosophy of Justus Liebig. Lest the subject suffer by my imperfect treatment, I shall endeavor to keep closely to the subject which it is capable of raising. But I must beg you to understand that I shall proceed by a severe process, that of analysis, for nothing less than the results of analysis of work done can establish as proved what many feel as a sentiment. You will understand both the censure and the acclamation of what we will call the world ; you will see the necessity for a reform in the philosophy of many of us ; you will see how the life and labor of one man has produced vast applications and industries, improved or created a large commerce, and enhanced or engendered art ; how it has soothed the pain and anguish of hundreds of thousands under the most severe trials of human organization, and how it has left a growing harvest in the hearts and minds of men all over the world.

Justus Liebig was born on the 12th of May, 1803, at Darmstadt, in the Grand Duchy of Hesse. His father was what in this country we should term a wholesale druggist or drysalter, a trade which is in Germany designated by the name of materialist. There is no doubt that the opportunities which he had of collecting chemical reagents, and of witnessing the preparation of many products which were the objects of his father's trade, early excited in him that curiosity which soon became an insatiable thirst. It is related on creditable testimony that at the age of fourteen years he had performed all the experiments of which he could get knowledge from books, or for which within his means he could obtain the materials ; and it is related by himself that about that time there was not a work in the library of the Grand Duke of Darmstadt, on chemistry, which he had not read. Looking at his early days by the light of that information, we cannot doubt that the anecdote ordinarily told of his having been a dull boy is a mere mistake. He was abstracted by other pursuits, and therefore, no doubt, neglected

his school work, but that he should have been less gifted than others cannot, under the circumstances, be believed. It is related by a credible person, that in 1817, when he and his school-fellows were speaking to each other as to what pursuit they were to select, he said that he was going to be a chemist, whereupon the other boys laughed at him and told him he was a great fool, for a chemist was nothing. However, times have changed, and what at that time was considered as no pursuit, is now an honored profession.

In the year 1818 he gave a distinct direction to that early bent of his mind, and he followed almost the only way which at that time existed in Germany for studying chemistry; he became an apprentice in an ordinary apothecary's establishment. An apothecary in Germany is a more scientific person than perhaps many would believe. He has had a thorough training, he has passed examinations, and he represents, therefore, the scientific side of chemistry, pharmacy, and the science of drugs in perfection. To such an apothecary, residing at Heppenheim, near Darmstadt, Liebig went, and remained there about ten months, but in that occupation as an apprentice his mind soon became wearied, he saw that he could not attain his object; and when, while continuing some of his early experiments on the fulminates, on one occasion he had the misfortune of producing a great explosion, this fact quickly terminated his apprenticeship, and he returned to Darmstadt. These explosions in the early days of great chemists are not uncommon. It is related in the case of Scheele, that when he was apprenticed to an apothecary he once had a great explosion, in consequence of which his landlady expelled him from the house.

Liebig returned to his father's house in the year 1814, and read for six months in order to prepare himself for visiting the University of Bonn. He there listened to the lectures on theoretical chemistry of the well-known Professor Kastner, and he also studied the other natural sciences and some languages, and what is very characteristic of his great genius and perseverance, he formed a society amongst the students for the purpose of teaching one another, and for discussing subjects connected with chemistry and physics. Kastner being called to Erlangen, Liebig followed him there, and we are told that there he read all the new chemical publications, established another students' society for the same object as the first, and made many friends amongst the students, of whom several continued that friendship up to their death. Thus the celebrated poet, Count Platen, corresponded with him to the time of his death in 1830, and of this friendship we can see many congenial

influences in the writings of Liebig, for there is no doubt that in his "Familiar Letters on Chemistry," the language, although always prose, frequently rises to the highest beauty, such as can only be produced by a mind of a poetical turn. The same influence of the classical period of German literature you will also perceive, for example, in the writings of Humboldt, particularly in his "Views on Nature," which are therefore considered as examples of classical German diction. Liebig also made the acquaintance of Bischof, the botanist, and of Englehard, later Professor of Chemistry at Nuremberg. He went in for the severe study of what at that time was called philosophy; that is, he listened to the lectures on metaphysics and philosophy in general of the then great Schelling. Now, let me give you the words of Liebig on that period of his life. He says: "I myself studied for some time in a university where the greatest philosophers and metaphysicians of the century carried the studying youths away to admiration and imitation. Who could at that time resist the infection? I, too, have lived and participated in this period so rich in words and ideas, so poor in true knowledge and solid studies; it has robbed me of two precious years of my life. I cannot describe the terror and dismay which I felt when I awoke from this giddy dream to consciousness. How many most gifted and talented men have I seen perish in this vertigo, how many wails about life objects completely missed have I been obliged to hear afterwards." Thus he spoke in his work on the study of the natural sciences, which was published at Brunswick in 1840.

Now, in order that you may be able to apprehend what this kind of philosophy was, and to understand more fully the position from which he had to emancipate himself, even at that early time of his life, I will quote to you a very few passages, and I will make them as short as possible compatible with illustration, from one of Schelling's works, from the periodical for speculative physics—mark the term "Speculative Physics." I will quote the following passage: "Nature strives in the dynamical sphere necessarily to absolute indifference; not by magnetism nor by electricity is represented the totality of the dynamical process, but only by the chemical process. With the third dimension of the product the two other dimensions are opposed. In nature itself there is one and inseparable, what is separated for the purpose of speculation." That is almost enough, but I will give you another passage which will be more striking because of the contrary itself being known to you. Here he says of the composition of water: "Water contains just the same as iron, but in absolute indifference as yonder in relative

indifference, carbon and nitrogen, and thus all true polarity of the earth is reduced to an original south and north which are fixed in the magnet." Now, in order that you may believe that he did not merely speak of an admixture or impurity of carbon or nitrogen, but that he meant to say that it was the essence of water, and that it was really composed of these two elements, and not of any other, he goes on to say: "The animal is in organic nature the iron; the plant is the water, for nature begins with the relative separation of the sexes, and then ends in this separation. The animal decomposes the iron, the plant decomposes the water. The female and the male sex of the plant is the carbon and the nitrogen of the water." These are two examples of the philosophy of Schelling, which was believed at that time to be the science by which Germany could be regenerated, by which the generation which had then only just recovered its independence would be put on a firm mental basis. The followers of this system were called to the Court of Prussia, and there Hegel, the philosopher, continued in a similar manner to teach doctrines which nowadays seem to be but a farrago of nonsense. Hegel says, for example, on the chemical process: "If electricity was the broken magnetism, because the opposite poles are independent bodies upon which the positive and negative electricity is distributed, and if the point of indifference is the explosion of an indifferent light by itself, then is the chemical process, on the other hand, the totality of the shaping. We have two independent bodies which belong more to the one or the other extreme; to the metal on the one hand, or the sulphur on the other, which meet in an indifferent medium, and by abandoning their abstract one-sidedness in which they decompose the medium combine to a third body which is the totality and the neutrality of the opposites, the dynamical process in its highest perfection."

When a young man of seventeen or eighteen years of age is capable of freeing himself from the trammels of such a chimera termed philosophy, which had taken such a deep hold of a whole nation as to cause to flock to the university where it was taught the selected youth of the whole country, you may give him credit for great power of mind, and for great independence of judgment. Do not forget that this development of the philosophy of Schelling and Hegel was a consequence of the latter part of the philosophy of Kant. Kant's philosophy was great, as long as it was based on the exact sciences, upon physics, and upon mathematics; but when he left that basis, and went into the speculative philosophy, he gradually went away from that basis which had

made his early philosophy so sound and so full of meaning for the perfection of the human understanding. On the other hand, when you come to a further development of the same philosophy, namely, that of Fichte, there the speculative part vanishes entirely into insignificance, because that which Fichte taught was not such kind of nonsense as that which I have read to you, but it was a kind of moral philosophy which spoke to the youth of Germany, and taught them this one great proposition, which every one of them ought to feel, and which is the first condition of self-consciousness in man, namely : "I am I ;" this was the great teaching of Fichte, by which he brought home to men their own value and their own powers, which cannot be said was the result of the other philosophy, from which I have quoted.

(To be Continued.)

CHROME STEEL.

As we noticed a short time since, the Chrome Steel Company have obtained the contract to furnish the steel and iron ropes required for the erection of the temporary foot bridge, cradle cables and other appliances necessary for the construction of the main cables of the East River bridge. The ropes will be furnished as required in the following order: First, four working ropes for pulling over wires, each rope to be 3,800 feet long, and of a breaking strength of not less than 18 tons. Second, a carrier rope of 3,710 feet, and a breaking strength of not less than 60 tons. Third, three cradle ropes of 3,625 feet in length, and a breaking strength of not less than 180 tons. Fourth, two foot bridge ropes of 3,625 and 3,688 feet long respectively, and a breaking strength of not less than 240 tons. Fifth, the under floor guys and suspenders, of an aggregate length of 10,868 feet. Sixth, the handrail ropes of a length of 3,500 feet. Seventh, the four pendulum ropes for separating strands of a length of 3,700 feet each.

The process of the manufacture of steel with chromium instead of carbon is of interest. In a general way, steel is understood to be a combination of iron with carbon, the percentage of the latter constituent varying according to the character of steel desired. Of course the quality is also more or less affected by the process of tempering and other causes, but after ages of practical experimenting, carbon steel is far from perfection, unless the celebrated Damascus blades, made in Persia, Syria and kindred countries, be carbon steel, which does not

appear certain, for the process of their manufacture has been thus far kept a profound secret, though great efforts have been made to ascertain the method and materials employed. But, setting that aside, and looking only at the skill, money and labor devoted for hundreds of years in England and other European countries to the manufacture of steel, and the efforts in France to produce a perfect imitation of the Damascus blade, without avail, it may be safely assumed that, with carbon as a constituent, man can go no farther in steel making than he has already gone. To this conclusion both the practical and scientific world appears long since to have come, and attention has in consequence been much devoted to experiments in steel making with other substances as a substitute for the carbon. Carbon is not a metal, and the combination with iron in the shape of steel can hardly be called an alloy, in the ordinary sense of the word. And it was probably with the idea suggested by this fact that experiments with iridium, chromium and other metals were undertaken, and in one case, at least, that of chromium, rendered successful.

The Chrome Steel Co. claims, among other excellencies of its process, that it can produce grade for grade, and with perfect certainty, a quality of steel unequalled in tenacity. The alloys of iron and chromium are definite, so that the guess-work of the skilled artisan in the carbon process is not necessary. In the latter, the workman ascertains by the look of the iron the amount of carbonization, but in chrome steel such a mode of ascertaining the combination is superseded by weighing.

Another point is that chrome is the only metal which will weld perfectly to iron under the rolls. And again, chrome steel can be worked in large masses without any injury by over-heating, which is not the case with carbon steel, which, under long continued heat, changes its character, or, as it is technically called, "burns." Chromium can only be separated from iron, after the alloy has once been made, by chemical analysis. Both are metals, and it requires a much higher temperature to melt chromium than iron. It has very little, if any, affinity for oxygen, and chrome steels cannot be burnt by heating like a carbon steel. The chrome steel comes from the furnace and the rolls with a much smoother surface and texture than carbon steel. The tensile strength of the combination is much greater than that of carbon steel.

Experiments made with the chrome steel by the celebrated civil engineer, David Kirkaldy, show that the maximum tensile strength of a half inch bar, square hammered and 5 inches in length, is equal to over 167,000 lbs., and the lowest 115,000 lbs. per square inch.

Other experiments with $1\frac{3}{4}$ inch bars gave as the highest tensile strength of chrome steel 199,000 lbs., and the lowest 164,000 lbs., while the highest of carbon steel is about 133,000 lbs. per square inch. The process used by the Chrome Steel Company is that invented by Mr. C. P. Haughian.

Capt. Eads employed chrome steel in the construction of the St. Louis bridge, after he had made careful tests of it as a material. One great point of its superiority over carbon steel was found in the fact that it maintains its strength to a remarkable degree when made up in large masses. "In compression," Capt. Eads remarks, "almost any degree of resistance can be obtained by the addition of chromium." These points make it especially valuable as a material for structures like bridges, requiring to be light and very strong at the same time.

The metal chrome is liberally distributed throughout the world, and as good a quality as can be found anywhere is mined near Baltimore, Md. Large deposits also exist in California and on the European Continent. As an ore it has a dark, rough appearance, very similar to that of magnetic iron ore, and is combined with quartz rock; but when reduced to a metal form, it assumes a fine gray appearance, and might readily be taken for iron, though it is much harder and more brittle.—*Iron Age.*

BOOK NOTICES.

THE STUDENT'S GUIDE TO DENTAL ANATOMY AND SURGERY, by Henry Sewill, Member of the Royal College of Surgeons and Licentiate in Dental Surgery, &c., &c. Philadelphia, Lindsay & Blakeston.
Price \$1.75.

A volume of 200 pages, neatly illustrated and printed on good paper, as may always be expected of any issue of these publishers.

A hasty examination of the work leads us to the conclusion that it is, as its name implies, intended for students rather than for practitioners.

Its chapters, of which there are sixteen, are by no means exhaustive in the treatment of the subjects discussed, and would not alone serve to fully instruct the student who without a tutor turns to their pages for a complete "Guide." It is fair to the author to say that in his preface he warns "the student that before he can profitably peruse any treatise on a specialty of physiology or surgery, he must familiarize himself with the fundamental principles of such sciences and with the technical terms employed in them."

We deem this volume of value, and worthy of a place in the library of every dental student, on exactly the basis claimed for it by Mr.

Sewill, as an "Outline of the subject," leading "the reader to desire, and (designed) to direct him in seeking the fuller knowledge afforded by more extended treatises."—[ED.]

NEW YORK ODONTOLOGICAL SOCIETY. Regular meeting, extra session, December 20th and 21st, 1875. Philadelphia, Samuel S. White. 1876.

A very neat volume, well edited, and printed with clear type on good paper. As much of its contents have already appeared in several dental journals of recent date, comment on its articles is unnecessary. It is fortunate, however, that the complete record of the papers and discussions of this Society be brought together and published in book form.

THE ANNUAL JOURNAL OF THE WISCONSIN STATE DENTAL SOCIETY. Proceedings for the year 1875. LaCrosse, Republican and Leader steam print. 1876.

The session of the Society, its fifth, was held at Milwaukee, Wis., and seems to have attracted the attendance of a large number of the prominent practitioners of the West, particularly of Chicago. It is of course necessary that accurate report of the presence or absence, the dismissal, dropping from the roll, withdrawal, &c., of members, be made by the proper officers of the Society, also that a full financial exhibit of its receipts and expenditures be made; it would, however, detract nothing from the value or dignity of the *published* proceedings, which contain essays and discussions of value, if the details referred to had been omitted or given much less in detail.

TRANSACTIONS OF THE OHIO STATE DENTAL SOCIETY. Tenth Annual Meeting, held in Columbus, December 1st, 2d and 3d, 1875. Publication Committee, J. Taft, H. Berry, F. W. Sage. Toledo, Ohio, J. R. B. Ransom, Esq.

In this publication the "Minutes" are published, but somewhat more concisely than in the Wisconsin proceedings, occupying rather less than half the number of pages, and even here some matters mentioned might have been omitted without injury to the volume.

The papers presented to the Society for its consideration seem to have been carefully prepared, and the discussions to have been participated in very generally by the members of the profession in attendance.

The Code of Ethics, and the Law Regulating the Practice of Dentistry in Ohio, are appended. The work of the publisher is well done.

NOTES.

Fifth District Dental Society of the State of New York.

At the annual meeting of the Fifth District Dental Society of the State of New York, held in the city of Rome, on the 13th and 14th of June, 1876, the following officers were elected for the ensuing year:

President—F. D. Nellis, Syracuse.

Vice-President. — H. W. Tompkins, Clayville.

Secretary—John S. Marshall, Syracuse.

Correspondent—A. B. Cowles, Rome.

Treasurer—George Elliott, Syracuse.

Censors—Charles Barnes, Syracuse; S. B. Palmer, Syracuse; H. P. Chambers, Lowville.

Delegates to the State Society—F. D. Nellis, George Elliott.

Delegates to the American Dental Association—Charles Barnes, H. W. Tompkins.

JOHN S. MARSHALL,
Recording Secretary.

New Jersey State Dental Society Meeting—Postponement.

In consequence of the annual meeting of the New York and Pennsylvania State Dental Societies at the time appointed for the meeting of the New Jersey State Dental Society, the latter meeting has been postponed one week, or to July 18th, 1876, at Atlantic City.—CHAS. A. MEEKER,

Secretary.

Benjamin Thompson, Count Rumford.

Just about one hundred years ago a young man left Boston with the British army, seemingly from no choice of his own, but simply because the chief among the pat-

riots of New Hampshire suspected that he was not loyal to the cause of freedom, and they appear to have acted upon the principle of convicting him first and trying him afterwards. He was only twenty-two when he left this country, and he never returned to it again except for a short time, when he served in the British army as colonel of cavalry in South Carolina and New York. Previous to this service he had for some time served the British government as under secretary of state. If these had been his only services rendered to mankind, Colonel Thompson would have been forgotten long ago. But after he returned to England he found himself with nothing to do. He still received half pay as a retired officer of the army, but his regiment had been disbanded at the close of the war. In this strait he started on his travels as a soldier of fortune. By chance almost, it seems, he strayed to Munich, where he soon entered into the employ of the King of Bavaria, still retaining his allegiance to the English government.

When he went to Munich he found everything in as miserable a state as can well be imagined. One-sixth of the inhabitants subsisted by beggary, and the army was but little better than an armed mob of beggars, who were systematically starved and forced to go half naked. When he left Munich there was not a beggar in the country, and the army was one of the best clothed and best fed in the world. But this was not all; while doing all this work in reorganizing the social system of a state, he still found time to write essays and make experiments on various subjects

which are only now beginning to be appreciated. He taught the people how to cook their food more economically while at the same time he made experiments which overturned all previous ideas in regard to heat, and established firmly the modern theory that heat is motion.

He wrote essays on Indian corn, and made experiments on the best methods of taking a bath; in short, no subject seems to have escaped his attention. But he appears to have always remembered the land of his birth, and in his will he made Harvard College his residuary legatee, besides founding a professorship in it of heat and light applied to the science of living. He also gave five thousand dollars to the American Academy at Boston, to found prizes for discoveries in these branches of science. This latter sum has accumulated until now it amounts to over forty-two thousand dollars. The Supreme Court of the State has permitted it to be slightly diverted from the original purpose, while still keeping the main object in view, and the income is now used for distributing information on these subjects and paying for original investigations.

As a means of disseminating information, the Academy has thought that nothing would be more valuable than the works of the count. These have been collected and carefully edited, and are now published in four large volumes, together with his life, which makes a fifth. Part of the fourth volume, which has just been published, deserves a much wider circulation than it will get in the volumes before us. We refer to the two essays on the treatment of the poor, which detail at length how the tramp nuisance was suppressed in Bavaria. It had arrived at a much worse point there than here and the country was far poorer than ours, yet the evil was successfully and completely met.

The volumes are published by the American Academy, of Boston, at the price of five dollars per volume.

S.

"Epipolar" Force.

When small pieces of camphor are placed on the surface of water, it is known that they turn about with the most capricious movements. This phenomenon has lately been studied by M. Lescœur, of the Chemical Society of Paris, in a number of other bodies. He arranges in two classes the substances that are endowed with the "epipolar" force, as he calls it: 1. Substances insoluble in water (fixed oils, fatty bodies, etc.); as soon as the spreading out has occurred, all movement is arrested, and the movement of any other body is suspended. 2. Substances soluble in water (camphor, acetic acid, essential oils); the superficial layer produced is dissolved or volatilized with more or less rapidity; the movement is continuous. The saturation of the liquid and of the surrounding atmosphere causes all action to cease. The phenomenon is one of capillarity, or of the superficial tension of liquids.

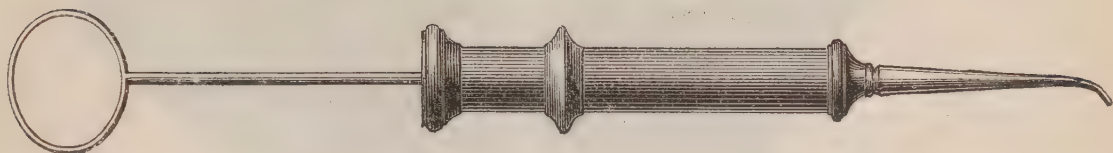
A young lady from Deatsville, Ky., went to Louisville one day last week to have a tooth drawn, and when the dentist asked if she would take gas she pulled out a bottle of whisky and remarked, "This is the kind of gas we take." The tooth was "extracted without pain."

Powder for Producing Ozone.

In order to produce artificial ozone, Mr. Lender makes use of equal parts of peroxide of manganese, permanganate of potash and oxalic acid. When this mixture is placed in contact with water, ozone is quickly generated. For a room of medium size two spoonfuls of this powder, placed on a dish and occasionally diluted with water, would be sufficient. The ozone develops itself; it disinfects the surrounding air without producing cough.

[*Scientific American.*]

SYRINGE.



This syringe, of metal, nickel-plated, is represented half-size. It is provided with a spring, a suggestion from Dr. A. H. Brockway, so that if after use it is placed in water its piston rises and it fills itself with water, and is so constantly ready for use.

The points, straight and curved, are removable at will.

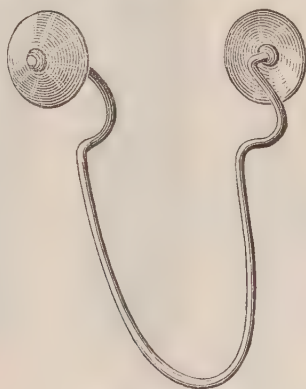
PRICES.

With one point, curved.....	\$2 25
With two points, one straight and one curved.	2 50

JOHNSTON BROTHERS,

812 Broadway, New York.

Elliott's Cheek Distender.



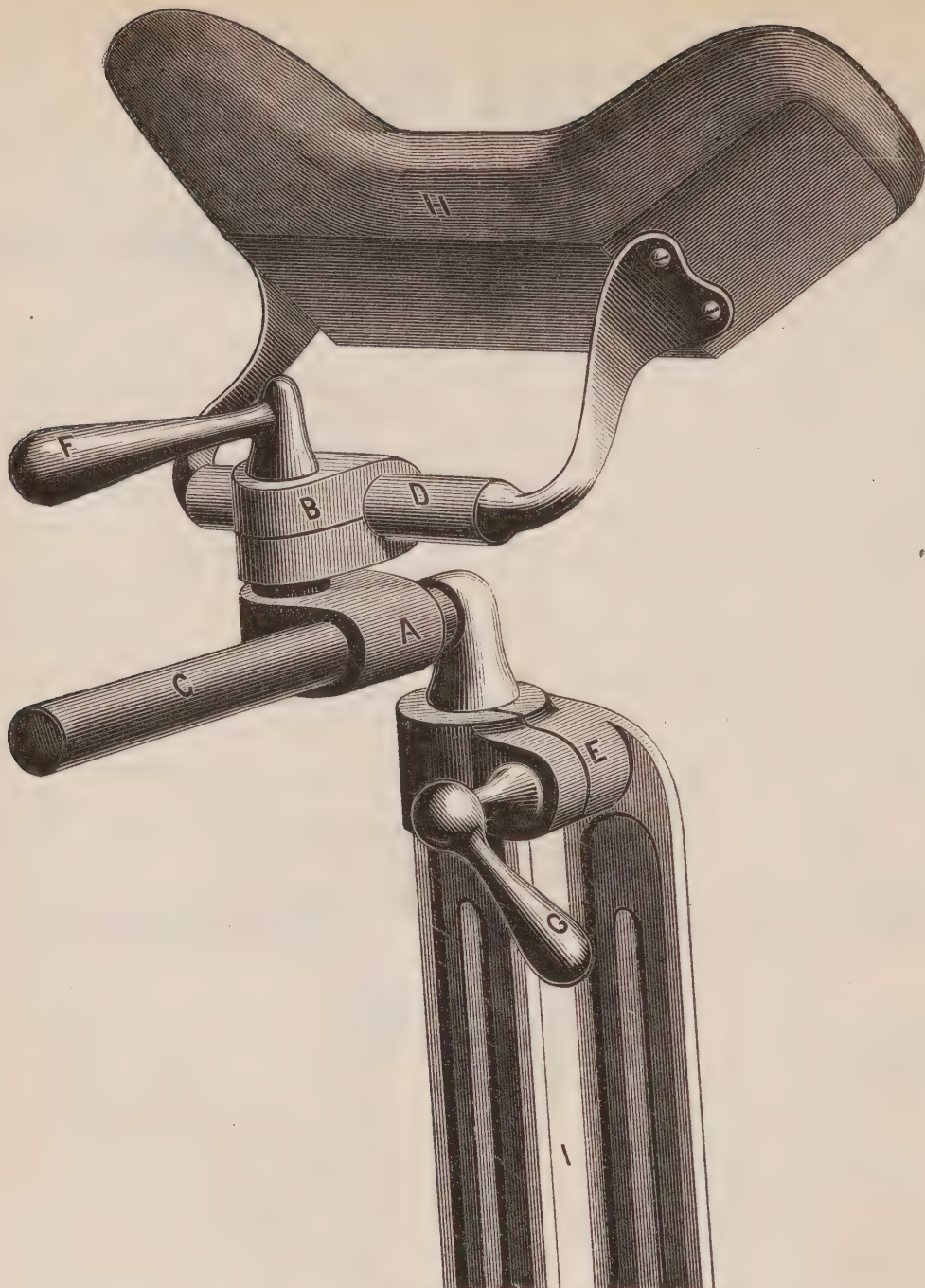
Cut is $\frac{1}{4}$ size.

This convenient device, as its name implies, is designed to distend the cheeks of a patient during operations on the teeth.

Its bow of spring wire, and the cheek pieces are polished and nickel plated. It serves, in connection with its principal use, to reflect light on the teeth. As the spring is not stiff it is worn with very slight inconvenience. *This is proving extremely popular.* Price \$1.00.

JOHNSTON BROS.,

812 Broadway, N. Y.



N E W

JOHNSTON HEAD REST.

NOW READY FOR DELIVERY.

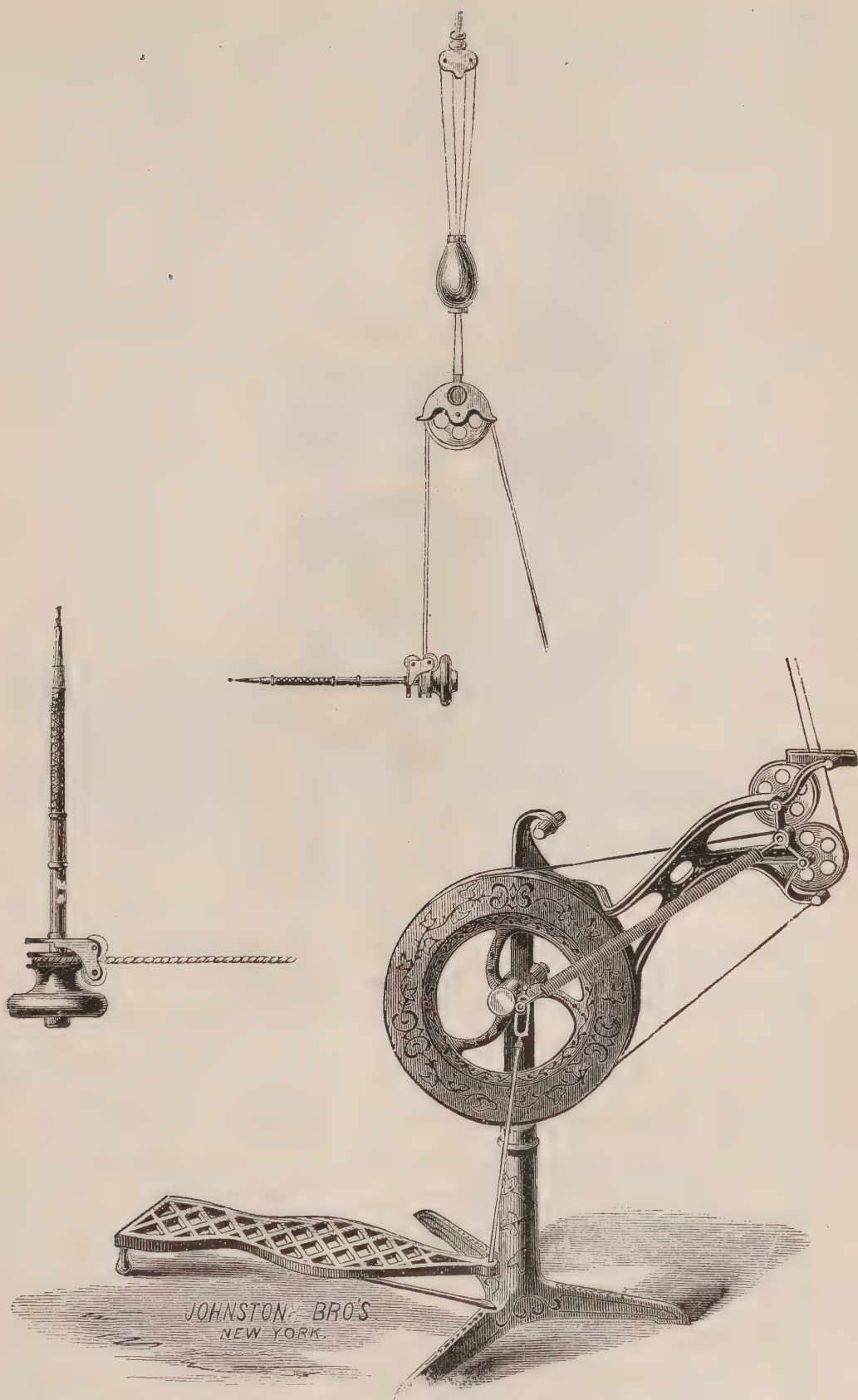
PRICES:

For Morrison Chair--complete with the upright casting which supports it..	\$20.00
If Morrison Head-rest and Support is returned	15.00
For Harris Chair.....	12.00

For Description see Advertising Pages preceding.

JOHNSTON BROS.,

812 Broadway, N. Y.

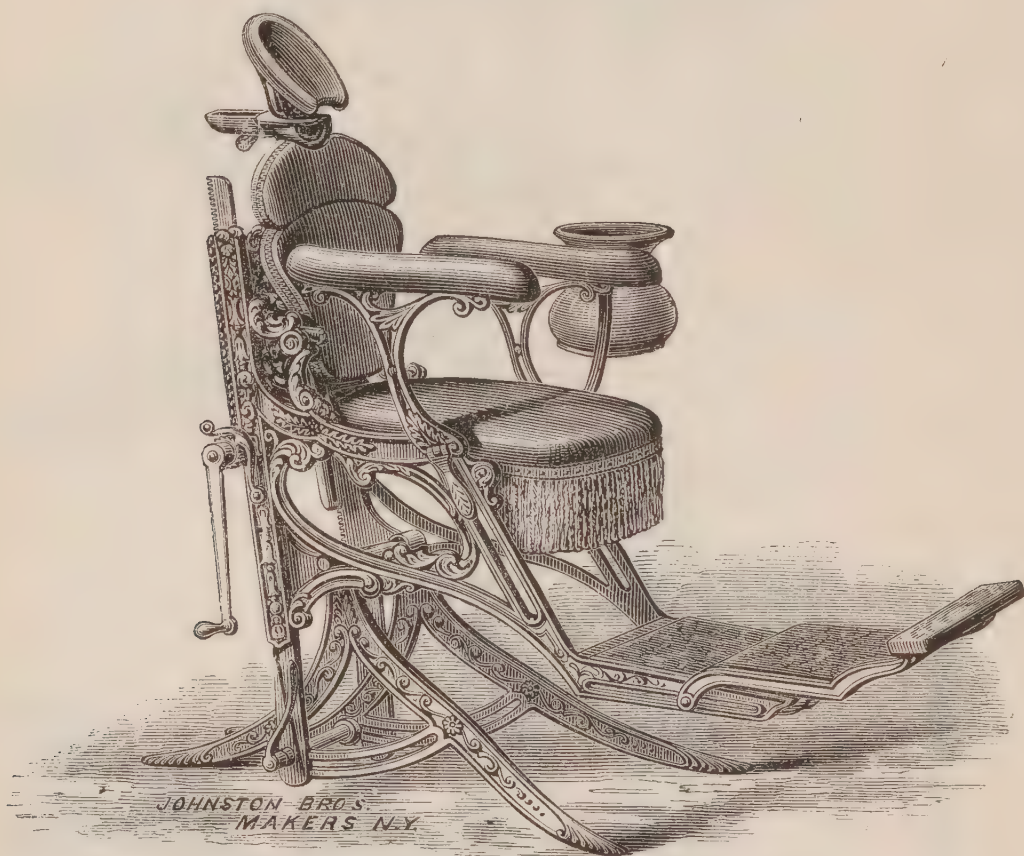


SUSPENSION DENTAL ENGINE.

(DR. ELLIOTT'S INVENTION.)

Price, \$50.00 Right Angle Attachment, \$5 00. Boxing, \$1.00.

THE MORRISON DENTAL CHAIR.



Price \$150.00, or, with Castors, \$160.00. Boxing, \$5.00.

Spittoon Attachment, \$8.00.

WITH JOHNSTON'S NEW HEAD-REST, \$8.00 EXTRA.

It possesses great superiority over any chair before offered to the profession, and is at the same time less expensive than any other first-class chair. Some of its points of superiority we here enumerate :

- 1st. All the advantages of any low-based chair, and also of any high-based chair, are here secured in a single chair. In it the patient can be placed lower than in the lowest-based chair made, or higher than in any other of which we have knowledge. At its lowest position the seat is fifteen inches, and at its highest position forty-two inches above the floor.
- 2d. The operator using the Morrison Chair can either stand or sit at his work, as he may choose, working with equal convenience in either position.
- 3d. It has been a very general complaint that dental chairs are too wide at the back, so holding the operator away from his work. Here this difficulty is overcome. The chair is narrow at the back, so that the operator need not stretch to reach the patient, but *can lower either arm of the chair out of the way* and so be as near the patient as he may choose.
- 4th. It can be changed from its lowest to its highest position in seven seconds - a celerity impossible in any chair raised by a screw.

5th. It can be very readily and perfectly adapted to operations on children of any age

First. Because in it the child can be raised as high as needed for the tallest operator.

Second. It provides a comfortable back and head rest, exactly as for grown persons.

Third. The footstool can be lengthened or shortened, to suit children of any size.

6th. The back of the chair can be lengthened or shortened rapidly and at will.

7th. The lower part of the back can be thrown forward to support the small of the patient's back.

8th. The chair, when adjusted to any position, is firm or steady wherever placed, and this is *especially true of the head-rest.*

9th. It occupies less room than any other operating chair.

10th. Although the footstool, when at its extreme length, is much longer than any other made, yet a person of ordinary weight can stand on its extremity without tipping the chair.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

We venture to append the names of some of those who have used the Morrison Chair. As the list of purchasers is too long for publication here, we name a few only from each section of the country.

O. A. JARVIS, *New York.*

D. H. GOODWILLIE, *New York.*

O. A. HOUGHTON, *Brooklyn, N. Y.*

A. C. HAWES, *New York.*

W. B. CHAMBERS, *Newark, O.*

C. B. ANSART, *Oil City, Pa.*

M. H. WEBB, *Lancaster, Pa.*

T. W. FRENCH, *Gt. Barrington, Mass.*

E. H. EVANS, *Rockland, Me.*

E. O. SMITH, *Salem, Oregon.*

W. F. LEWIS, *Winona, Minn.*

T. J. McMILLAIN, *Paris, Ky.*

G. W. TINDALL, *Kansas City, Mo.*

A. W. KINGSLEY, *Elizabeth, N. J.*

J. N. SCRANTON, *Bennington, Vt.*

O. A. GLIDDEN, *New York.*

JAMES MCMANUS, *Hartford, Conn.*

R. F. BORDEN, *Red Bank, N. J.*

F. A. SHAILER, *Essex, Conn.*

WILLIAM DUTCH, *San Francisco, Cal.*

R. B. DONALDSON, *Washington, D. C.*

B. F. COY, *Baltimore, Md.*

C. P. CLIFFORD, *Lowell, Mass.*

S. H. HINKEL, *Stannton, Va.*

E. G. WHEELER, *Mobile, Ala.*

J. A. DAVIS, *Chicago, Ill.*

C. B. ERICHSON, *New Britain, Conn.*

H. BENTLEY, *West Meriden, Conn.*

H. H. SAYLES, *Elmira, N. Y.*

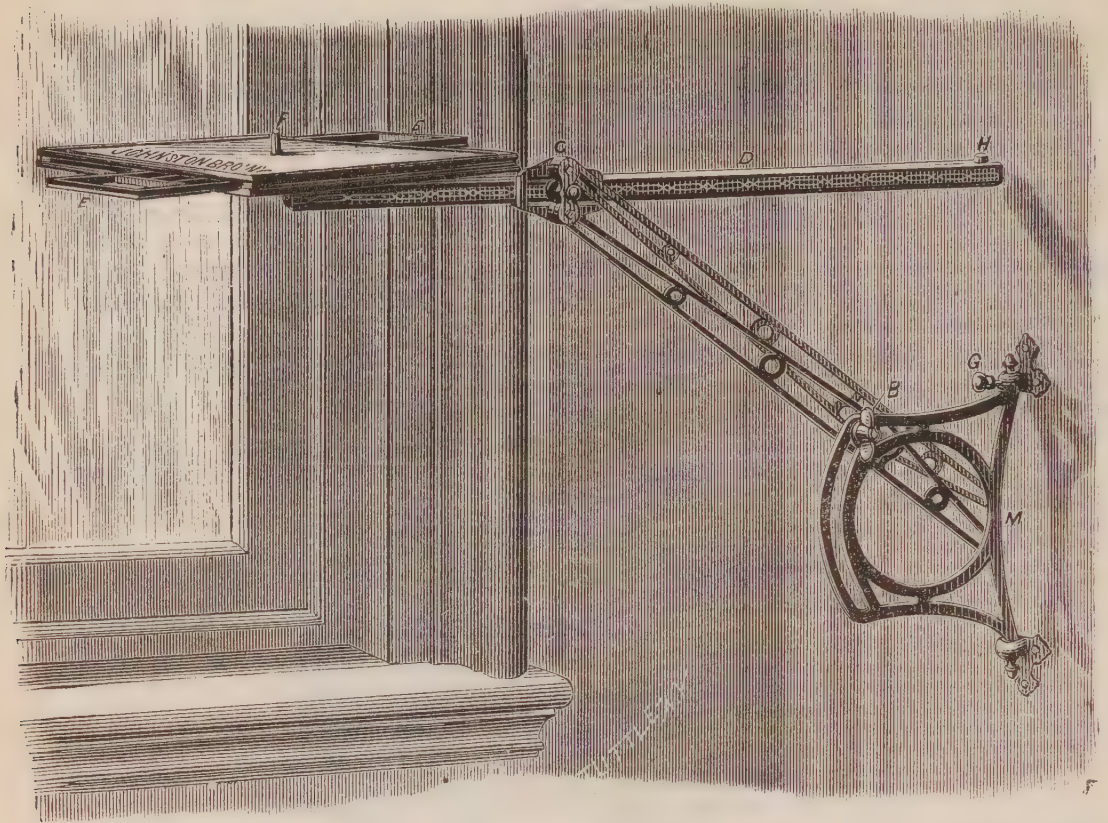
PRESTON DAY, *Warren, R. I.*

E. T. DARBY, *Philadelphia, Pa.*

G. W. TRIPP, *Auburn, N. Y.*

H. B. SANDS, M.D., Surgeon, *New York*

MORRISON DENTAL BRACKET



PRICES.

With Black Walnut Table, 12 inches square.....	\$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather.....	40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket.....	17.00.
Boxing.....	\$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

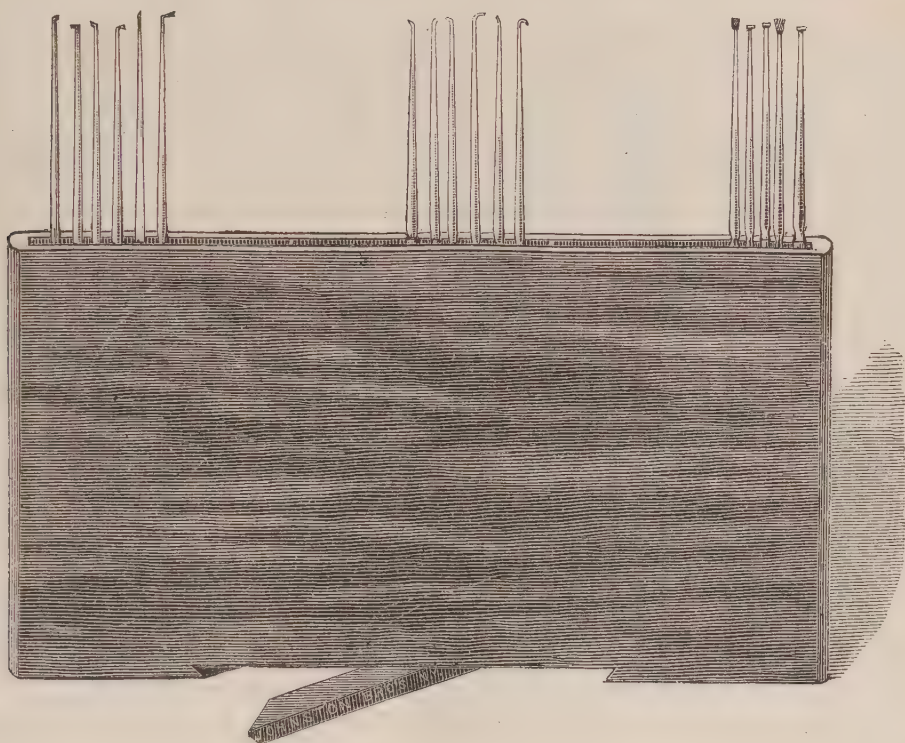
- 1st. It combines a greater variety of range and movement than any other.
- 2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
- 3d. It provides a clean receptacle for foil and instruments.
- 4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
- 5th. Its drawers extend through the table and can be opened from either side.
- 6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

Fitch's Instrument Stand.



Both time and money are saved by any arrangement by which a dentist's tools are so distributed that he can at a glance recognize, and conveniently lay hold of any desired point.

It is a further convenience, if, when night comes, he may lay them in his drawer secure from dust without disarranging them. Dr. Fitch, of Lee, Mass., has designed an instrument stand for hand tools which combines these advantages. When placed on the table for use it is firm in its upright position, and the point of each instrument in it is distinctly presented to view. When its foot is closed into its base it is but 5-8 of an inch thick, and can be laid flat in any drawer without disturbing the instruments.

We make two sizes—No. 1, for excavating burs, &c., having 3-16 inch handles ; No. 2, for pluggers, &c., having 3-8 inch handles.

Price of each.....\$1.50

JOHNSTON BROTHERS,
812 Broadway, N. Y.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($\text{NO}^2 + 2\text{O} = \text{NO}^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid Nitrous Oxide*, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether.....	I	death to 23,204 administrations.	
Chloroform.....	I	2,723	"
Mixed Chloroform and Ether....	I	5,588	"
Bi-chloride of Methylene.....	I	7,000	"
NITROUS OXIDE.....		no Deaths in 75,000	"

Edward R. Squibb, M.D., than whom our country has no more able pharmacist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

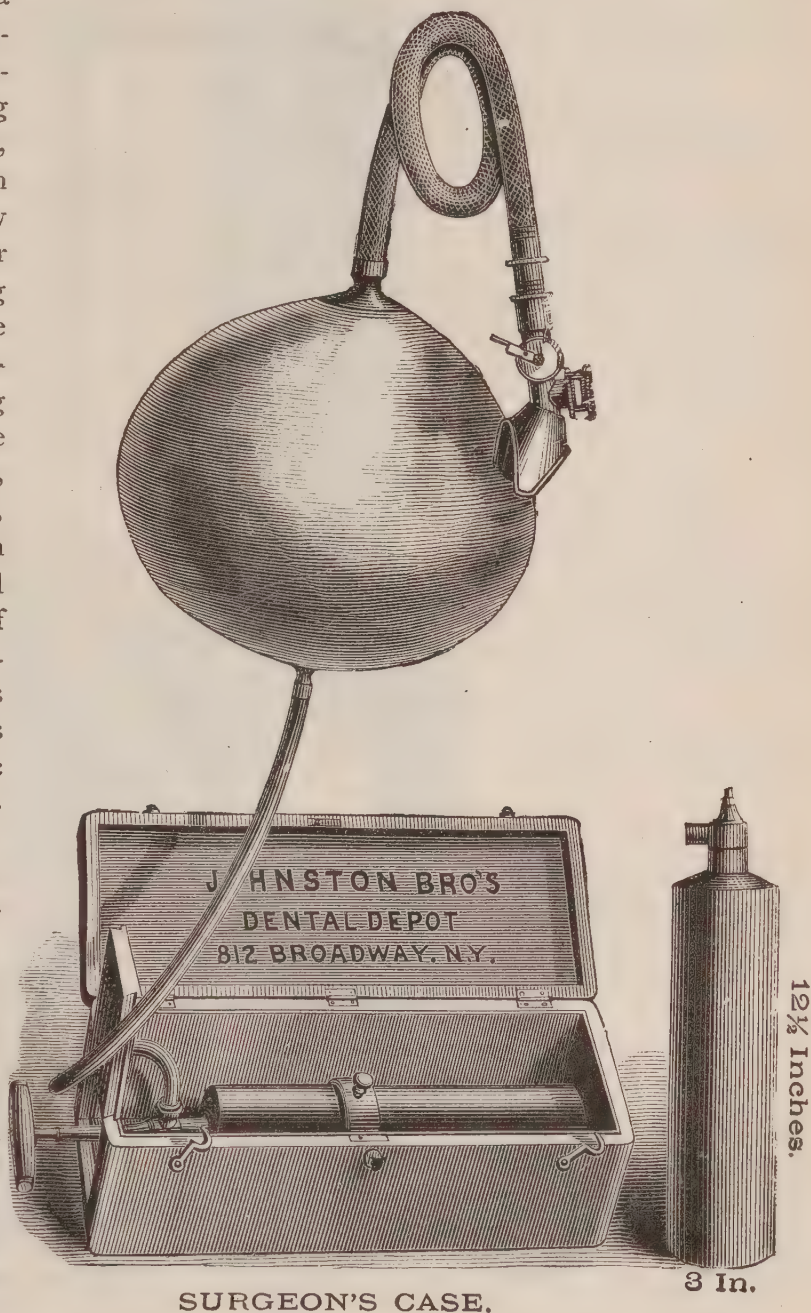
Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

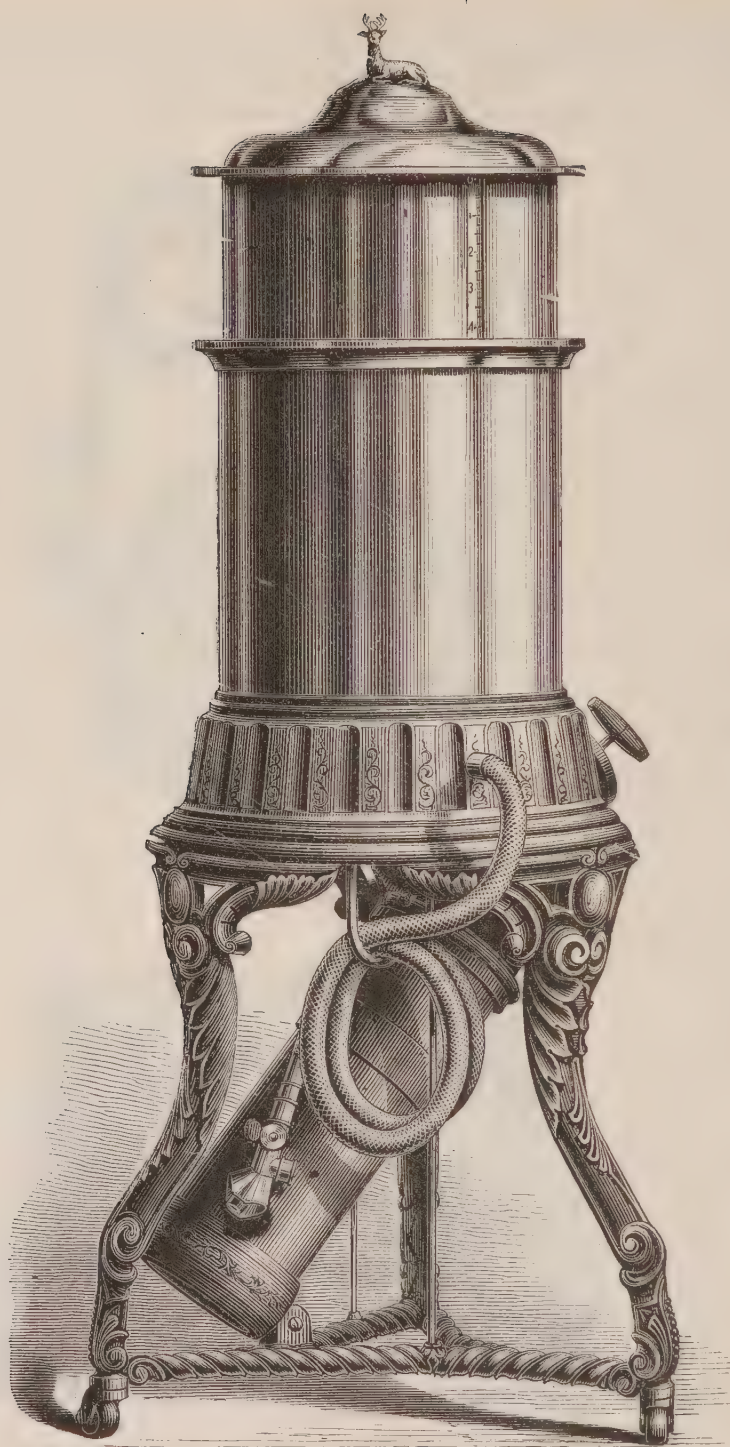
Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers

without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.



NICKEL-PLATED GASOMETER
AND ORNAMENTED STAND
FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas—this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality*.

JOHNSTON BROS., 812 Broadway, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler **No. 1** . . . \$42 00

Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic

Inhaler **No. 2** . . . 45 00

Boxing either, \$1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas 16 00

Refilling Cylinder 6 00

Nickel-Plated Gasometer, with ornamented iron stand 128 00

Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered Tubing) 12 00

1000 Gallon Cylinder 36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of $4\frac{1}{2}$ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at $4\frac{1}{2}$ cents 45 00

Morocco covered case, with ring and thumb screw, velvet lined 12 00

Polished bl'k walnut “ “ “ “ “ “ 13 00

Of these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity) 5 00

Rubber Bag, with covered inhaler tubing, extra size 7 00

Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection 9 50

Key, Nickel Plated 1 50

Wrench, “ “ “ “ “ “ 50

Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag 1 50

Covered Inhaler Tubing, per foot 50

Plated Connection to fit old style Inhaler 1 00

JOHNSTON BROS.,

812 Broadway, N. Y.



THICKNESS.

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..7	60	1.00	1.50	2.00
..7 $\frac{1}{4}$	75	1.25	2.00	3.00
..7 $\frac{1}{2}$	90	1.40	2.40	3.40
..8	1.00	1.50	2.50	3.50
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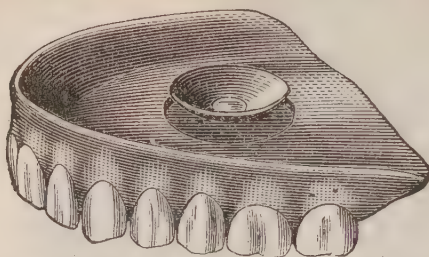
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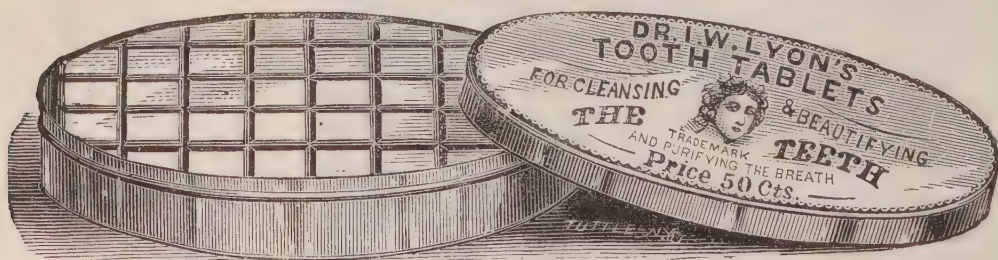
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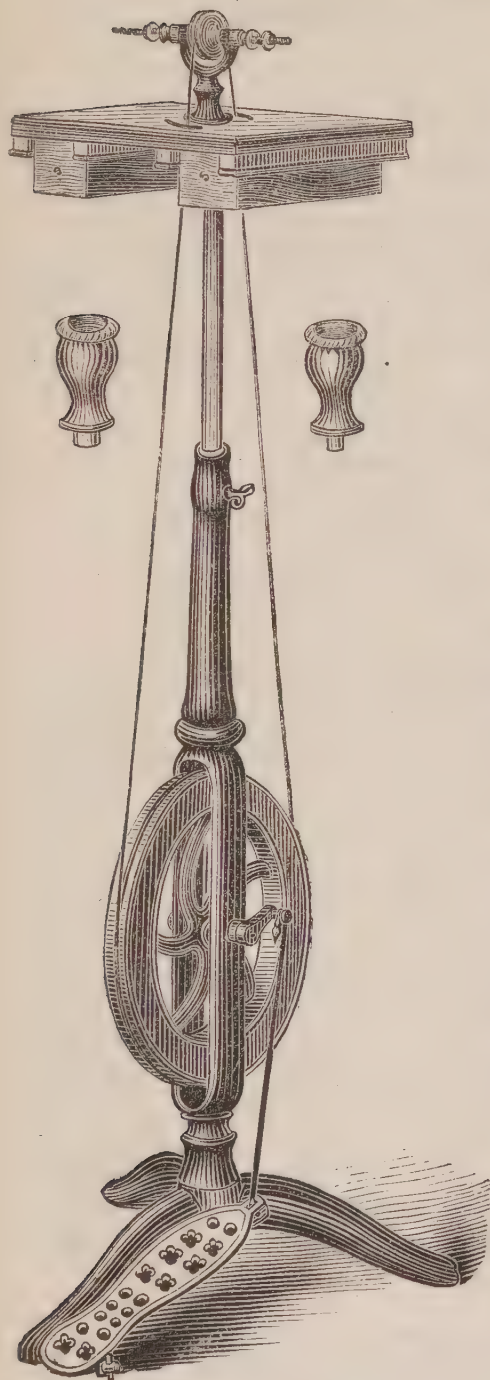
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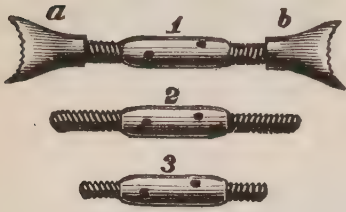
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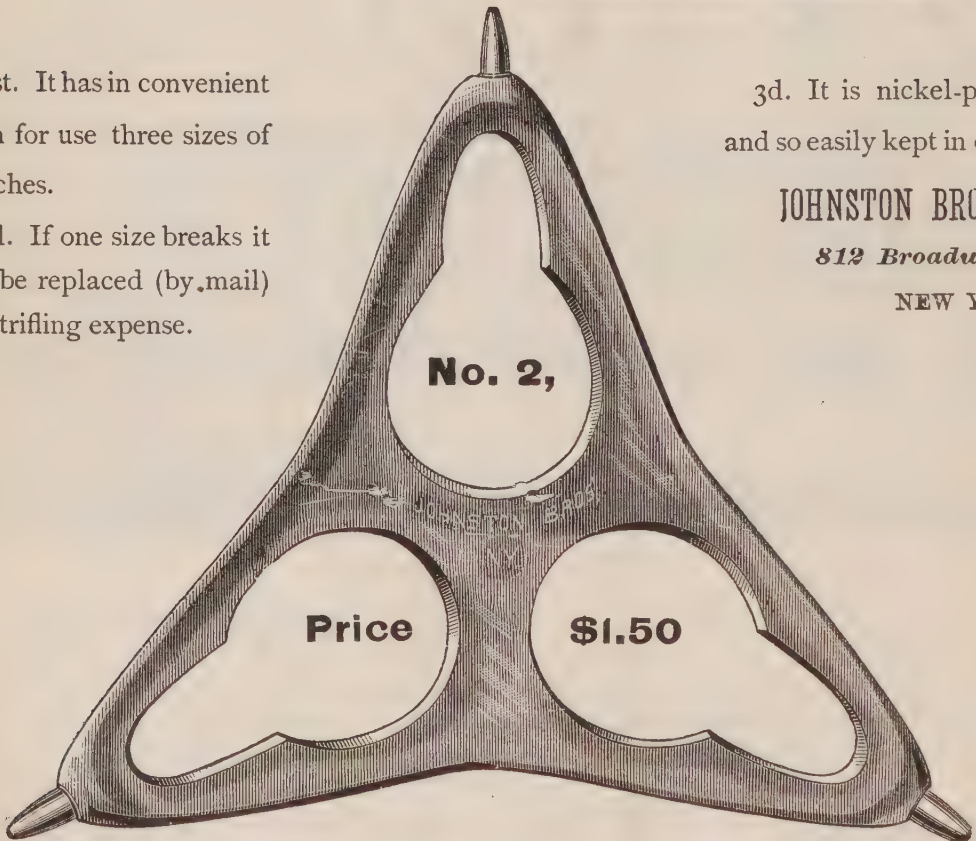


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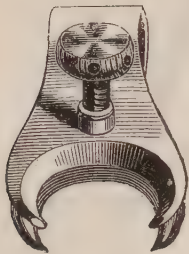
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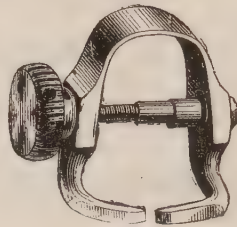
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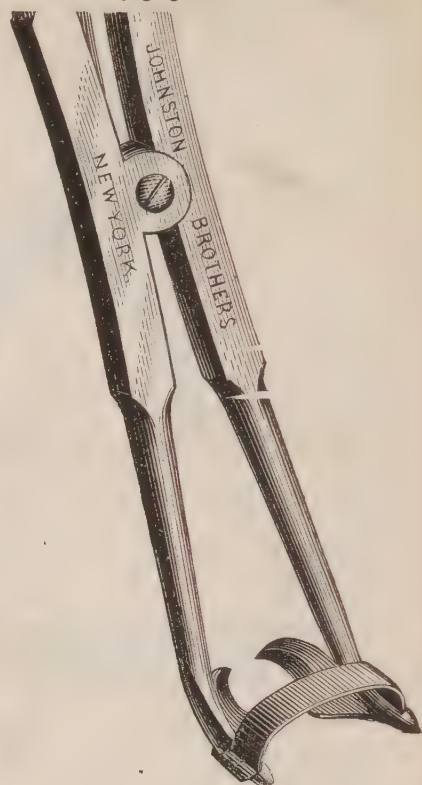
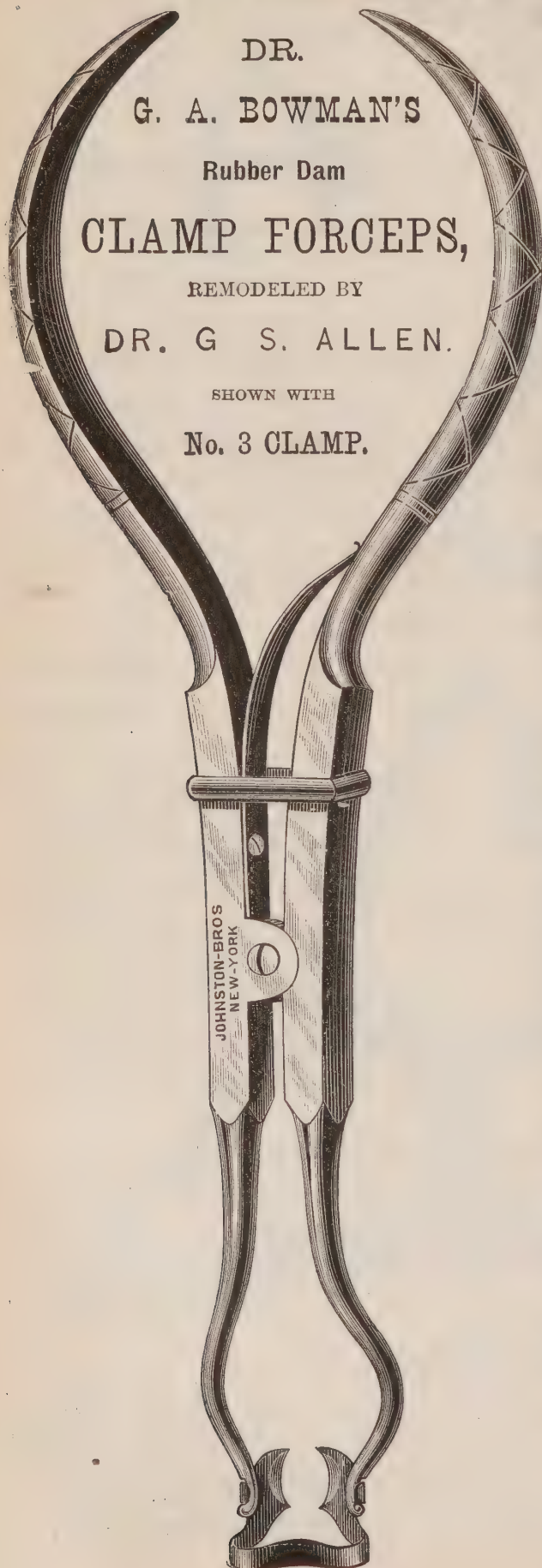
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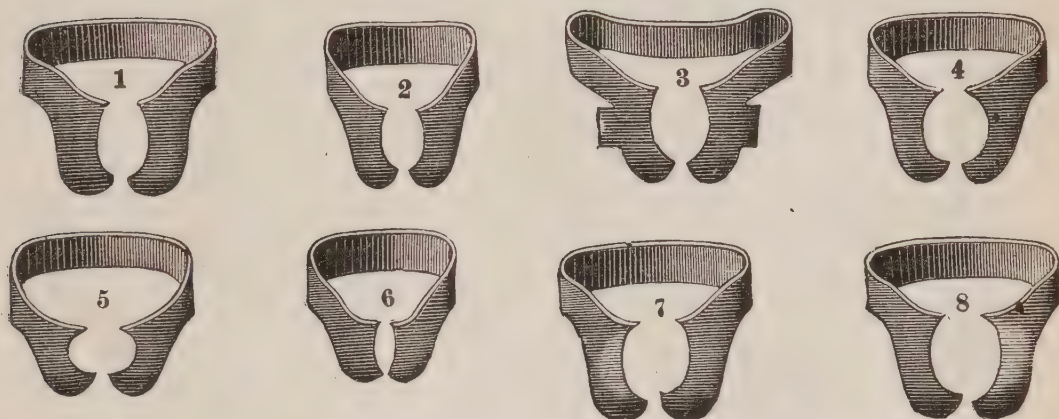
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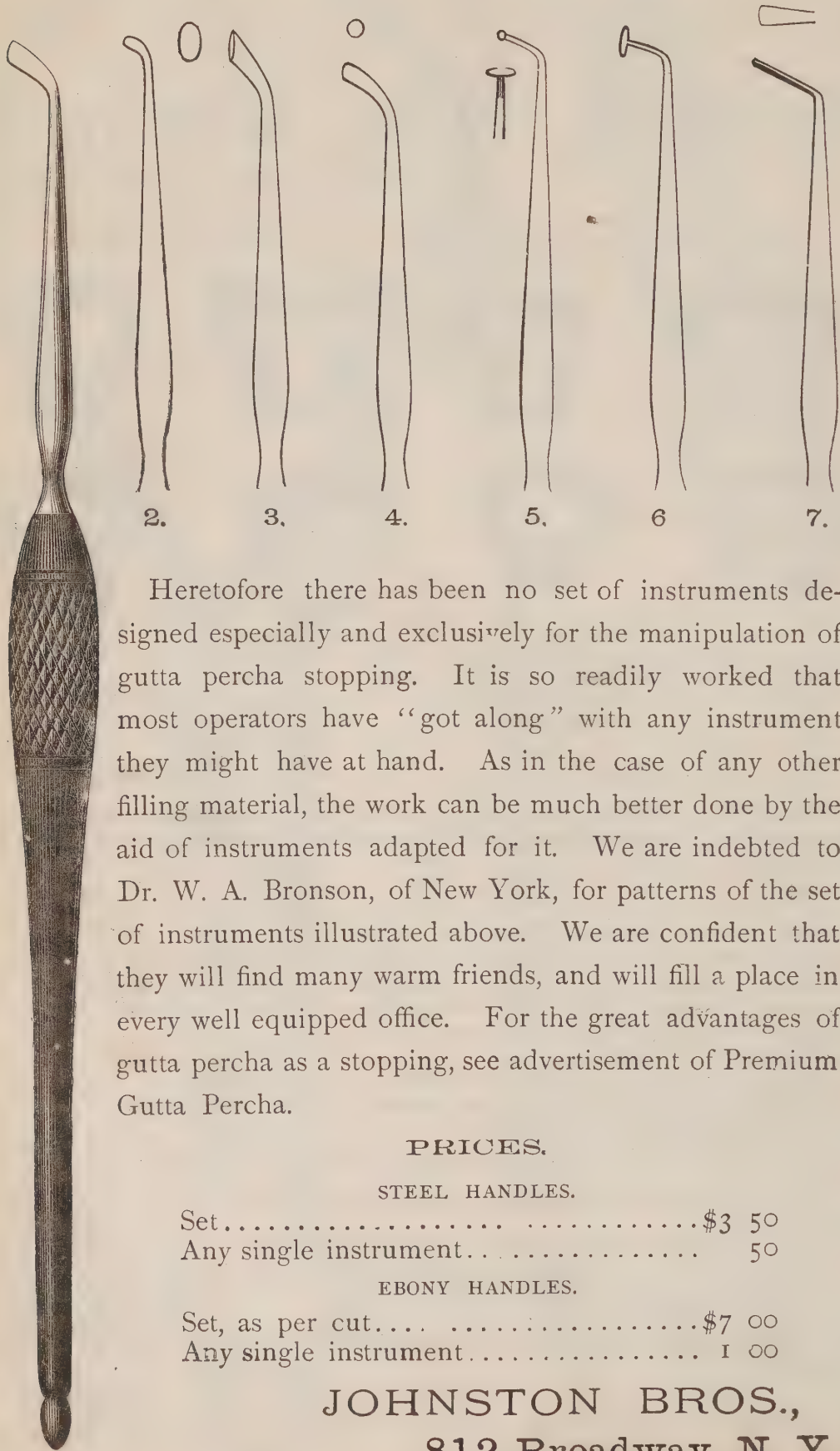
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*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

JULY, 1876.

NEW YORK :
JOHNSTON BROTHERS,
812 BROADWAY.

JOHNSTON'S

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FOR 1875.

It is certainly reasonable cause of self-congratulation on the part of the publishers of this Journal, that the end of the first year of its publication finds it with a large and constantly increasing list of subscribers, and that they are constantly in receipt of letters of encouragement and commendation from their readers in every section of the country, and even from distant portions of the world, one such letter being recently received from Japan.

We are promised one or more articles from each of the following gentlemen of established reputation, and others of like standing in the profession have encouraged the expectation of like favors from them.

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CASE OF IRREGULARITY.

By N. W. KINGSLEY.

At a recent meeting of the Odontological Society of New York, while the subject of the extraction of teeth was under discussion, very marked disapprobation was expressed of removing any sound teeth from a crowded dental arch for the correction of an irregularity. The position assumed was, that the only correct treatment required the enlargement of the arch sufficiently to bring the teeth into line. I will not attempt to repeat the arguments then made, further than to say that I then stated that I had never seen a condition of irregularity, where, if taken at the proper age, all the teeth could not be brought into line; that as a mere question of scientific skill it could probably always be done, but my own experience taught me that in a majority of cases the highest good of the patient was *not* reached by such a course, and that in my judgment the present and future welfare of the patient was often better conserved by the removal of one or more teeth.

Since that meeting, which was but a few weeks ago, a case of irregularity has come into my hands which has been treated successfully to completion; which illustrates the subject, and I believe justifies my position.

Fig. 1 shows the arrangement and articulation of the teeth as the patient was presented to me—a Miss of about fifteen years. It will be observed that both lower canines shut outside the upper lateral incisors. So also does the right lower central close outside the upper central. All the six front teeth of both upper and lower jaws are in an irregular condition; the lower ones being more marked.

A brief history of the case showed that at some former period, the superior incisors were all shutting inside the lower ones, and the patient, then living in a distant city, had been under treatment and the superior arch expanded until the present condition was reached. During this process the plate used in the expansion of the arch was made to cover the grinding surfaces of the upper teeth, and mastication went on between the lower teeth and this plate. When the patient fell into my hands, there was a retaining plate on the upper jaw, which in like manner covered the grinding surfaces of the teeth. I have always publicly and in practice disapproved of such a *gag*, as not only unnecessary, but as productive of positive harm.

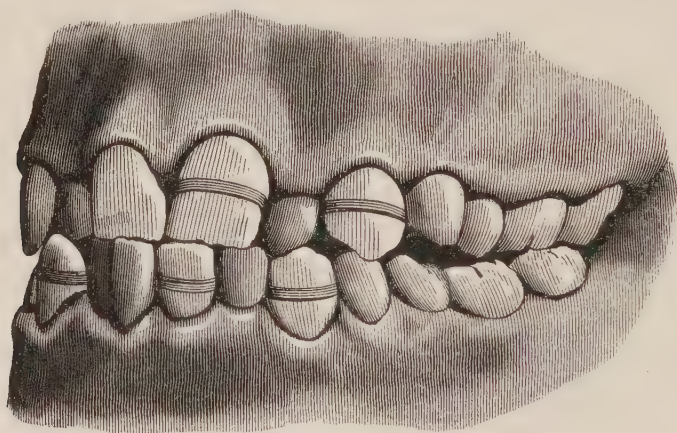


FIG. 1.

This case illustrates the harm, for when I removed that plate it showed that the normal articulation of the teeth had so long been interfered with that the teeth would now touch only in a few points, these points being the extreme molars and the incisors; these being the only teeth that were free to develop—not being held back by the plate. When this so-called retaining plate was out of the mouth and the jaws in contact, there were spaces at the sides where the teeth did not meet each other by nearly a sixteenth of an inch.

There comes now a diagnosis of the case which cannot be made from a study of models, but requires a personal examination of the patient. The model does not indicate any peculiar or unnatural pitch to the superior incisors, but a very cursory observation of the patient's face on opening the mouth showed that the apices of the roots of the superior incisors were based on a contracted circle, and that any further marked expansion of the arch and advancement of the crowns would give a bad pitch to those teeth and a disagreeable expression to the mouth.

Furthermore the upper arch was already well developed. It was of normal breadth, and large enough in its circle to admit all the teeth into line. This was sufficient ground to abstain from any further efforts at the enlargement of the upper jaw.

Turning now to the lower jaw we find it of breadth equal to the upper, but the teeth jumbled in front, and crowded out of line. *And just here develops the necessity and the wisdom of extraction.* As a fact in science, all these teeth of the lower jaw can unquestionably be brought into line by an expansion of the arch, and it would be equally a fact that if it were done the *deformity* of the mouth would be increased, as an enlargement equal to that purpose would place all the lower front teeth outside the upper ones. No further expansion of the upper arch could be effected without spoiling the expression of the mouth.

There remained but one alternative, viz., the reduction in size of the lower arch.

I extracted the right lower incisor, leaving, of course, but three teeth between the canines, and applied immediately the fixture shown in



FIG. 2.

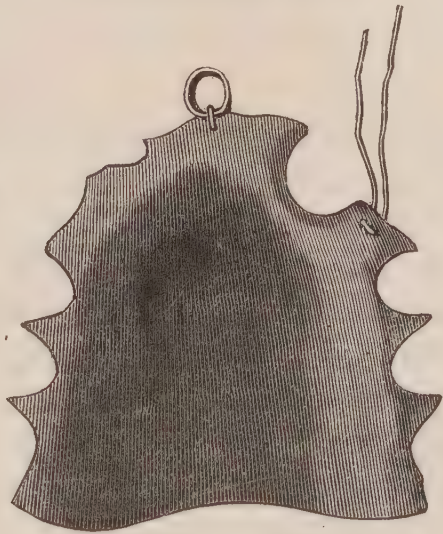


FIG. 3.

Fig. 2. It was a very simple plate of vulcanite, with three rings of elastic tubing attached to it, and when *in situ*, one ring was stretched over the remaining central incisor and the others over the canines. The plate was cut away behind these three teeth to permit of their falling back under the strain.

The position assumed by the elastics is shown in Fig. 1.

At the same time a fixture, as shown in Fig. 3, was adapted to the upper jaw, to lift out the left lateral incisor.

When in position its work is that of an elastic ligature tied to the plate between the central incisors (see Fig. 1), then passed outside the central underneath the lateral, outside the canine, and tied to the plate between the canine and bicuspid. Such a fixture would inevitably draw in the canine and central at the same time it was lifting out the lateral, did not the plate rest against them and thus prevent it. Within ten days the teeth of both jaws were in position, as shown in Fig. 4.



FIG. 4.

The space caused by the removal of the central was entirely closed, and there was no leaning of the teeth toward each other noticeable by an ordinary observer, and I doubt whether the absence of that tooth will ever be detected, except by the professional eye.

My object in this detailed description is to show :

1st. That not only is the extraction of a sound tooth for the correction of an irregularity necessary, but we are fully justified in removing one of the teeth most fully exposed to view.

2d. To again protest against building up *gags* on the grinding surfaces of teeth, as mischievous in their results.

3d. The simplicity of fixture with which a case of considerable irregularity can be corrected ; and,

4th. The necessity of a study of the surrounding features, as well as the model, before a correct diagnosis can be made.

ON THE RETARDED ERUPTION AND THE EXTINCTION OF WISDOM TEETH.

CASE OF ABSCESS WITH FISTULÆ FROM BURIED INFERIOR DENS SAPIENTIÆ,
LYING HORIZONTALLY BELOW THE ALVEOLAR MARGIN, ETC.

Read before the Odontological Society of Great Britain, by MR. FELIX WEISS, L.D.S.

MR. PRESIDENT AND GENTLEMEN: Running through the whole range of Dental Physiology, there are perhaps few subjects that present more interesting matter for investigation than the development and eruption of teeth; and if one tooth more than another may be cited as presenting an individual claim to be considered separately, it is the dens sapientiæ. Watching the gradual eruption of the permanent set, the changes that take place in the condition of the surrounding structures, and the provision that nature makes that each should ultimately assume its proper place, we are led to acknowledge the mighty Wisdom that rules our creation, and the fitness of all things for the purpose for which they were intended. Let us briefly recapitulate the conditions under which the wisdom tooth, as it is called, makes its appearance, and the results occasionally met with where this tooth cannot take up its proper position.

Dentition having proceeded to the eruption of the second molar, the maxillæ are now fully occupied, and a pause takes place. We wait for the elongation of the jaw backwards, in normal cases from three to five years. If all be then favorable, another molar is added to the circle, but the eruption of this third molar is not generally unattended with pain. We have frequently a series of disturbances, the least of which is a certain amount of suffering to the patient, at times sufficiently distressing to call for professional attention; and upon examining more minutely the results, we perceive that the second molar standing in front and the termination of the alveolus behind, the wisdom tooth not having a predecessor, and its development being carried on beneath the base of the coronoid process, when the time arrives for its eruption it has no space reserved for it, and in the generality of cases it cannot take its place without a certain amount of suffering, more particularly in the lower jaw; nor is this limited only to the part affected; it extends to the surrounding structures, causing the neighboring muscles to become more or less rigid, and setting up inflammation, attended sometimes by suppuration, the pus not unfrequently burrowing around the periosteum of the jaw, giving very much the appearance of necrosed

bone, and, indeed, occasionally leading to necrosis of the jaw. Nor is this the only annoyance resulting from the attempted eruption of the third molar. Frequently the tooth takes a different direction, and remains buried in the alveolus, or even ascends the ramus of the jaw, or becomes impacted against the second molar. Such cases must be more or less familiar to you all, and are very explicitly recorded in Tomes' "Manual" and Salter's "Dental Pathology."

If we continue our observation, we shall also find that this particular tooth varies not only in shape, but also in size. On the right we may have a perfectly-developed molar; on the left a cubic-crowned tooth, resembling the lower bicuspid. But that which more than anything else distinguishes these strangely variable teeth is the irregular periods at which they are erupted, and that they are in many instances absent altogether. Feeling that some reliable statistics on this interesting subject would be desirable, and having failed to discover any record that can guide us to a true estimate of the number of wisdom teeth absent in a given number of cases, I some time ago began to draw up such a record. The plan I adopted is very simple. I commenced by excluding all cases under the age of 26, taking particular care that the wisdom tooth had not been extracted, and where any doubt existed did not register the case at all. I took down first the name of the person, as a guide for future examination, if necessary; then the age, followed by the present state of the mouth as regards the wisdom teeth; and lastly, remarks upon any abnormality that might present itself. In private practice this is a longer and more tedious investigation than any one unacquainted with the detail of an operation-room could readily believe; but it has this great advantage: you can refer to your list and vouch for the accuracy of your statistics. I am sorry that the number of cases is not so large as I hope eventually to be able to classify; and I may here remark that arrangements might be very readily made at our dental hospitals to record such statistics. There are many points that I think might thus be satisfactorily elucidated. According to my observations, of 312 persons over 26 years of age, 152 had deficiencies of wisdom teeth; 29 had none at all; 44 had deficiencies in the upper and lower; 76 had deficiencies in the upper only; 32 had deficiencies in the lower only; 21 with deficiencies were over 50 years of age. In 312 persons, 304 wisdom teeth were absent.

It will be readily understood that, to obtain a return of any great value of persons having deficiencies of wisdom teeth in advanced life, a very large number of mouths must be examined, and the greatest care

taken that our records are carefully compiled; for it is sometimes difficult to decide whether the tooth has been erupted and extracted, or never erupted at all. As a rule, where the tooth has never been erupted, the gum will present a square appearance; but where it has been extracted, the absorption will have defined the ridge of the maxilla.

Before proceeding, I should like to refer you to two passages in Mr. Tomes' work on "Dental Surgery"; and I may here be permitted to bear testimony to the invariable accuracy that distinguishes that admirable manual. In the second edition, p. 224, we read:

"The great variability in the size and the shape of the wisdom tooth in civilized races, its occasional absence, and the irregularity of the period at which it is erupted, may, when contrasted with its large size and regular form in the lowest savage races, be taken as an indication that the wisdom tooth is slowly disappearing, and that there is a strong probability that in future generations it will be normally absent."

Then at page 208 we read: "I believe, when one description of tooth only is wanting, it will generally be found that the lateral incisor is the missing member. Perhaps we should except from this rule the wisdom teeth. They, however, are so extremely irregular in all respects, as compared with the other teeth, that we are seldom in a position to declare them absent, although they may not have appeared above the surface of the gums. But if the third molars are less frequently absent than the lateral incisors, they stand next in the order of absentees."

That the wisdom teeth are erupted late in life we have plenty of evidence to prove, but that they are sometimes absent altogether I am fully persuaded, and that they take the first place as absentees my late examinations seem to indicate. I have seen several mouths where the third molar has been cut after the age of 70, and in one case a patient had attained his 84th year. I have only been able personally to record a deficiency of laterals in four instances, and in two of these the teeth were cut later in life, after wearing artificial work.

I have particularly noticed that wherever any of the fourteen permanent teeth are absent, the wisdom teeth will be found to be missing also. In the table of deficiencies of wisdom teeth already quoted, I have registered two instances where the superior lateral incisors have never been erupted, and in both these cases the wisdom teeth are also absent, although the patients are over 30 years of age. I can mention another person, aged 40, in whose mouth the second bicuspid of the lower jaw is wanting, and in its place we have the temporary molar; while in both the upper and the lower jaw there are no wisdom teeth. A similar case

is also entered where the temporary molars are standing on both sides, but neither in the one jaw or the other are there any signs of the third molar. The lady's age is over 40. As I have said, in every case coming under my notice, where any deficiencies of permanent teeth exist, the wisdom teeth are also absent.

Several very interesting questions spring out of these investigations, —questions I should like to see this Society endeavoring to answer. May not the wisdom tooth remain through life unerupted? You will observe in various specimens, jaws where the teeth are ground down, giving every indication of years of wear, and where the subjects must have passed the meridian of life, and yet the third molar remains buried in the alveolus.

Again, may not the original tooth-germ be sometimes absorbed, leaving no vestige of its past existence? I am sorry that I am not in a position at present to bring forward many preparations to establish my views on this subject; but as far as those investigations have extended, I have no hesitation in stating that I believe such to be the case. In one lower jaw I had an opportunity of examining, the fourteen teeth were all perfectly formed; but there was no indication of a wisdom tooth ever having been developed. In another the fourteen upper teeth were all thoroughly erupted, but no third molar could be discovered. I believe, Mr. President, that the extinction of the dens sapientiae opens a field for much interesting research well worthy of the consideration of the profession; and I look with considerable interest to the remarks my paper may possibly elicit from the members of this Society.

In Dr. Darwin's "Descent of Man," after remarking upon the gradual disappearance of the wisdom tooth, the smallness of its size, and the late period at which it is erupted, he goes on to contrast the number of the fangs of this tooth among civilized people and the earlier savage races.

It should be borne in mind that this change is more perceptible in the upper than in the lower; indeed, the lower wisdom tooth, where it is erupted, is usually of the normal size, and this will account in some measure for the disturbance frequently created by its eruption in that jaw more than the upper. The two fangs are certainly somewhat flattened and turned backwards, but in other respects the tooth has very little changed. In the upper, we have a gradual merging of the three fangs into one, and the size of the tooth, as I have said, is becoming smaller and smaller, until at length we very commonly find the upper dentes sapientiae no larger than lower bicuspid.

It was my intention to have brought before you this evening several

cases of impacted wisdom teeth ; but as these cases bear a very strong resemblance to each other, I shall content myself by relating the particulars of one where the buried tooth produced chronic abscess and fistulæ, and was found below the alveolar margin.

On the 16th of February, 1874, I was visited by Mr. S. H. B., *æt.* 43, a delicate and highly nervous gentleman, who complained of severe pain in the region of the inferior molars on the right side. He stated that he had suffered from a swelling in the sulcus between the cheek and the alveolus, which, after about ten days, discharged pus, the opening then healing up. I made a careful examination of the mouth, but without discovering any traces of its past existence. The second bicuspid had been extracted, but the space was nearly filled up. Two molars were standing on this side, both perfectly sound, nor was there any indication of inflammation in the surrounding parts. One of the molars had a filling in the centre of the crown, but this was not likely to produce the symptoms complained of. The wisdom tooth, I observed, was absent, and I inquired whether at any time it had been extracted, but was assured that it had never been erupted. As the patient was much out of health I recommended that he should consult his medical adviser, and see me in a month or six weeks' time. In May, 1874, Mr. S. H. B. again called, having had a slight return of the symptoms, accompanied by a disagreeable taste in the mouth, the muscles becoming somewhat contracted. I again examined the mouth carefully, and found an opening opposite the second molar, from which pus was exuding, and a slight swelling at the angle of the jaw. These symptoms pointed to necrosis, but the wisdom tooth being absent, I felt justified in suggesting the removal of the second molar, and making a search for the missing tooth. This, however, the patient was reluctant to consent to ; it was therefore determined that he should pay Mr. Thomas Bryant a visit to ascertain whether there were any dead bone ; but that gentleman was unable, without an operation, to give any opinion on the case, remarking that if the dentist had not sent the patient to him, he should certainly have sent the patient to the dentist ; however, it was proposed that chloroform should be administered, and a thorough examination made of that side of the jaw. This visit was at first postponed, owing to family illness, and finally abandoned, the symptoms having subsided, the muscle recovering its normal elasticity, and the patient's health becoming much improved.

October 29th, 1875, I again saw this case. During the seventeen months that had intervened I had not had a visit from the patient ; he

informed me that during this period, somewhere about the month of May, the abscess had once more returned ; that this time it had broken externally, giving him great relief, and the cheek had healed up again; that he had been free from pain until the first week in September, when he went into the country for a holiday. Once more the old symptoms returned, the abscess again formed, broke internally, and in three places externally, the jaw becoming perfectly rigid. Mr. Barnett, of Leominster, where the patient was visiting at the time, was called in, and he administered ether, and made an examination of the jaw externally, but it seemed to all appearance healthy. The muscle was now so rigid that the mouth could only be opened about a quarter of an inch ; but he managed to pass down a probe on the inside, and felt what I had all along believed to be the missing tooth buried behind the second molar. At the end of October the patient returned to London, and on the 29th, as I have said, he visited me. The mouth could now be opened about half an inch, and there was a fetid discharge, both internally and externally, by three fistulous openings. I at once decided to remove the second molar ; but this was a matter of no small difficulty, owing to the contraction of the muscle. Nitrous oxide gas was however administered, the mouth forcibly wedged open, and, assisted by my son and Mr. Gurnell Hammond (who happened to be accidentally in the house at the time), the tooth was turned over with a hawk's-bill forceps. A portion of the fang, however, was broken off, owing to the acuteness of angle at which it had to be extracted. The bleeding having subsided, and the patient sufficiently recovered, an examination of the mouth was made, and there the wisdom tooth was discovered lying horizontally below the level of the alveolar margin, its masticating surface being directed forwards and downwards, proving that it had been pressing against the fang of the second molar just removed. The patient was too much exhausted to submit to any further operation on this occasion ; he was therefore directed to keep a plug of cotton-wool saturated with Condyl's fluid over the tooth, to prevent the gum from healing over it, and another appointment was made for the 5th of November ; but on this occasion he was found to be in too excited a state to be brought fairly under the influence of the nitrous oxide gas. An examination of the mouth was, however, made ; the tooth could now be fairly seen, and it appeared to be trying to raise itself to a perpendicular position. The patient had suffered but little since the last operation, the inflammation had greatly subsided, and externally the cheek was fast healing. From the second week in September to the present

date, November the 5th, he had not been able to open his mouth sufficiently wide to take any solid food ; it was therefore decided to postpone any further operation for the present, and it was not until the end of the year the mouth could be opened wide enough to continue the operation with any chance of success.

January 6th, 1876.—At length an appointment was made for this date, when Mr. Clover attended and administered ether and nitrous oxide gas. The tooth had by this time raised itself a little above the margin of the alveolus, and it was safely extracted, and also the piece of fang previously broken off the molar. The difficulty of removal will be more readily understood when the wisdom tooth is examined ; for, growing at right angles to the fangs, is what appears to me to be an exostosed bony tumor, giving an appearance of a third fang, and owing to the position in which the tooth was placed adding considerably to the difficulties of extraction. It is to be regretted that the advice given in May, 1874, was not taken, and the molar tooth then extracted, as much pain and anxiety would have been spared ; it must also be borne in mind that the patient was of so nervous a temperament that even the most ordinary examination of the mouth could not be successfully performed unless he was placed under the influence of an anæsthetic.

February 18th.—All the disagreeable symptoms have now entirely subsided. Four small pieces of bone have come away, and the gum is gradually closing over. The fistulæ in the cheek have also healed, and the tannic acid and chlorate of potass mouth-wash he was directed to use has been discontinued.

ON THE DISCOVERIES AND PHILOSOPHY OF LIEBIG.

WITH ESPECIAL REFERENCE TO THEIR INFLUENCE UPON THE ADVANCEMENT OF ARTS, MANUFACTURES AND COMMERCE.

BY T. L. W. THUDICHUM, M.D.

General Sketch of Life and Labors.

(Concluded).

In 1822, Liebig, having emancipated himself from this kind of teaching, took the degree of Doctor of Philosophy at Erlangen, when he was nineteen years old. In the autumn of that year he returned to Darmstadt ; his researches and endeavors then became known, and he attracted the attention of the Grand Duke Ludwig I, of Hesse Darm-

stadt, who conferred upon him a State stipend, to enable him to continue his studies at Paris. To Paris, therefore, he went. Now let us for a moment consider what was then the condition of chemistry at Paris. Lavoisier, the great reformer, who had established what was then called the antiphlogistic chemistry, had thirty years before died on the scaffold ; Guyton de Morveau, Fourcroy, and Berthollet, whom the first Napoleon called the *plus brave des Français*, because he gave him chlorate of potassum, by which he hoped to overcome the want of nitre for his gunpowder ; the great Société d'Arcueil, which worked through the whole of the war times zealously at science, and published its memoirs ; all these men had passed away. But there remained their disciples in the persons of Proust, Chevreul, Vauquelin, Gay-Lussac, Thénard, and Dulong. Chevreul is the only one of these celebrated men who now lives, and he has lately published, in the *Comptes Rendus*, a very remarkable paper on the changes which are produced in the power of thinking and observing by age. Fourcroy, the great animal chemist, who, in connection with Vauquelin, laid the foundation of that physiological chemistry on which the modern science is based ; then Gay-Lussac, Thénard, and Dulong, men of the new science, who continued the work in a most glorious manner which in this country had been carried to such a glorious issue by Humphrey Davy—these men were at that time teaching at Paris, and at the laboratory which the liberality of the first Napoleon and his envy of English discoveries had established at *L'Ecole Polytechnique*. They continued to study and shape the new science which was destined to give to the modern science of chemistry precision.

Liebig then worked with Thénard, listened to Gay-Lussac's lectures, and he met there the young German chemists, Runge, well known by his many researches on tar and the tar products ; Mitscherlich, the discoverer of isomorphism and polymorphism ; Gustav Rose, the representative of the perfection of analytical and inorganic chemistry. In 1823, he brought his first paper on the fulminates of silver and mercury before the Academy. And now, let me quote to you what he says of that event in the first work which he ever published. In the preface, which is a dedication to Alexander von Humboldt, he says that at the meeting of the Academy on the 28th of July, 1823, he had read his paper, and was just engaged in packing up his apparatus and preparations, when a man, one of the members of the Academy, approached him, entered into conversation with him, and in an incredible short space of time knew how to elicit from him all his hopes, schemes, and

intentions. He did not dare to ask, either from shyness or from accident, who the gentleman was who spoke to him, and he disappeared again amongst the academicians. But he says, "from that day all the doors of society and of all institutions were open to me. I did not know until many years afterwards to whom I owed this introduction and favor." It was to Humboldt, who had so well recommended him to the great French chemists, that Gay-Lussac, who never took any pupil whatever into his laboratory, accepted him as his only pupil, and more than that, joined with him in his continuation of those researches which at that early age he had brought to such perfection. This preface is beautiful in its conception and feeling, and has been printed in all the seven editions of the work which have since been published. If there were time, this would perhaps be the place to show the wonderful influence which Humboldt has exercised upon the science of all countries; how he everywhere endeavored to attach the talents, to perfect their welfare, to introduce them into good positions, to make them teachers or workers; how he everywhere supported attempts and doctrines down to the very end of his long life; and I might, for example, quote the remarkable influence which he had in establishing, through and with Col. Sabine, the magnetic observatories which this country has so splendidly arranged in various parts of the globe; but I see time passes so quickly that I must pass over that subject and continue the account of Liebig's life.

Through the recommendations of Humboldt and Gay-Lussac, both of which were addressed directly to the Grand Duke of Hesse Darmstadt, Liebig was, at the age of 21 years, by the supreme will and absolute power of the Grand Duke, appointed first Professor of Chemistry in the University of Giessen. A new chair was established for him; and as a laboratory he received a room, as he expresses it, with four walls. Great was the opposition against this new professor; for what was chemistry? Chemistry was no science, nobody knew anything of chemistry, nobody would have it. Moreover the appointment had not been made in the regular way, therefore the whole of the authorities of the University set themselves against it. The consequence was, that the majority of that University persecuted that man for 27 years; and no matter what was his reputation, the amount of his work, or the importance of his position, for 27 years this man could never once be made Rector of the University of Giessen. But where are the opposing influences now? History will not mention their names. Their ultramontane participators tried to decry the great man as an atheist and materialist,

and by that means to remove from him the assistance of the State, and to diminish his chance of gaining a living. But he was too strong for all of them. In the year 1826 he was appointed Professor in Ordinary, a promotion by which he became a fixed servant of the State and a fixed member of the University. In that year he married Henrietta Moldenhauer, a most amiable lady, who now survives him.

Now comes the period of work, which lasted to the year 1834. The work itself I will not now enter upon, but we will, in the future lectures, see what was the nature of that work. We will perform before your eyes some of those operations by which that work has become of the utmost importance to mankind at large; and you can then see how, from a small point, there can be a light shed upon the largest problems of science.

In this year 1834, however, Liebig fell ill from overwork and anxiety. A portrait which was taken at that time by the now deceased painter Engel, gives evidence of that, and I remember that the late Professor Zamminer told me that he had seen Liebig about that time taking short walks in the evening air, looking pale and haggard, like a man in consumption, with little spots of hectic on his cheeks, and that his friends were afraid he would soon die. At that time he retired from Giessen for a time, and went to Baden Baden, in the hope of recruiting his health. The patience which he had exercised for many years under the most narrow arrangements then gave way, and he asked for the building of a new lecture room, the arrangement of a proper laboratory, and for an increase of salary. All was refused by the narrow-minded Government of Hesse Darmstadt, through that close-minded man, the then Chancellor, von Linde. Then Liebig wrote to von Linde a letter, in which, after the introduction, he continues thus:—"I should have gained some convenience by these arrangements, but they were not intended for me personally; they would have been of lasting value for the University, and would have secured to the chemical chair an advantage over all others in Germany. For the institutions of a University the largest sums may be expended, for this increases the respect and affection for them; but the suitable employment of these sums must be strictly controlled. The sums are there, but they are used in an intolerably ridiculous manner. I must be certain of what I may have to expect at Giessen. If driven to extremities I shall not return there this winter, whether I obtain leave or not. I shall know how to justify this step, for no one has been maltreated in the University in a more conspicuous manner. One cannot live at Giessen upon a salary of 800

florins. Four years ago, I, in conjunction with four colleagues, asked for an increase of salary; it has been refused. You (the Chancellor von Linde) have assured me with smiles that the State treasury had no funds; from this I saw that you had never known grief and torturing care for the daily bread. From the moment of that refusal I have endeavored to acquire an independent position by ceaseless work; my exertions have not been without success, but they have surpassed my strength, and I have become an invalid; and if now, when I do not require the State any longer, I consider that, with a few miserable hundred florins more, my health need not have suffered in former years, because my life would have been more free from care, the hardest thought for me is that my situation was known to you. The means which the laboratory possesses have been too small from the beginning. I had four walls given to me instead of a furnished laboratory. Notwithstanding my requests, no sum for furnishing the same, or for buying apparatus, has been provided. I required instruments and specimens, and have been obliged to spend on these items annually from 300 to 400 florins from my own means; besides the famulus paid by the State I required an assistant, who cost me 320 florins—deduct both expenses from my salary, and there remains not enough to clothe my children. From this original treatment of the laboratory the consequence has arisen that it possesses no property, for I can show that the arrangements, fittings, instruments, specimens which have made the Giessen laboratory—I can say it without blushing—the first in Germany, are my property. I will say nothing more about myself—my account with Giessen is closed. My path is not the one of reptiles, the easiest, though the dirtiest. What I have said will suffice to justify with the ministry and the Prince my resolution not to lecture at Giessen during this winter (1834-35). If I am in health, I may not lack the power to establish a kind of university for my branches of science at my own risk. If I am not permitted, and if I receive my *congé*, this will free me from the charge of ingratitude towards the country from the means of which my scientific training has been possible. I have learned to bear much injustice, many a false judgment, but this reproach of ingratitude would be too heavy for me to bear.” This letter pictures to you the conditions which prevailed at Darmstadt, but it is still more important, because it shows that such strong language was required to bring down the ministry, and that which no kind of friendly representation had been able to effect, this threat did. In 1835 he had to take compulsory repose. I find in the list of his publications only three small papers dating from

this period, of which one only was a research, but in almost every other year there were from ten to twenty researches and publications.

In 1836 another active period begins. In that year there were nine researches by himself alone, thirteen by himself and Pelouze. In 1837 there were nine researches by himself, and five with Wöhler, including the celebrated one on lithic acid and two with the celebrated French chemist, Dumas. In that year the British Association for the Advancement of Science, at their Liverpool meeting, made a request to him to write a report on the then state of knowledge of organic chemistry. It was this report which originated the work which he published in 1840, namely, the work entitled, "Organic Chemistry in its Application to Agriculture and Physiology." In 1838 he published a memoir on the state of chemistry in Austria, in which he exhibited its shortcomings in trenchant language, and the effect upon the Austrian Government was such as no one would have expected. In reply to his essay he received the offer of a chair at Vienna. "Come to us," they said, "reform our chemistry, and we will give you a chair." But the conditions were not sufficient, and the Austrian Government, having received Liebig's refusal to go to Vienna, at their own expense sent a number of young chemists to Giessen, there to study chemistry under Liebig, and to prepare themselves for the important function of becoming teachers of the new chemistry in Austria. In the year 1840 he published the work which I have already mentioned, and he published a memoir on the state of chemistry in Prussia. You know what was the state of Prussia in 1840; the promises made by the King in the year 1813 regarding a liberal constitution had all been falsified; a narrow-minded bureaucracy governed everything; a minister of education who did not comprehend his time, could not understand that physical science required any promotion or any State help. He soon went into that movement which has been described as *muckerthum*, a kind of pietism which shows itself by casting up the eyes in a praying attitude, having God more on the tongue than in the heart; by a mock modest morality which would, for example, have caused the council of this institution to have these beautiful nymphs on our walls painted over with drapery. Under these circumstances no science could progress, and there was not in the whole of Prussia a single establishment, laboratory, or teaching room where a man could learn practical or even theoretical chemistry. It was the great boast of even talented teachers of chemistry, that all the apparatus they required for teaching was a dozen test tubes. This attack on the state of chemistry in Prussia had no effect whatever of a good kind, but,

on the contrary, the bureaucracy used its power and influence to prevent the Prussian youth from visiting the University of Giessen, and I have the authority of Kolbe that for a time the visiting this University was actually forbidden to young Prussians.

About this time Liebig purchased from the municipality of Giessen a sand-pit, at a place called Trieb, on a little height east of the town, and there he made experiments on vegetable physiology. This place bears the name of "Liebig's Height" to the present day, and I dare say it will bear it for many years to come. He also published his work on "Chemistry in its applications to Physiology and Pathology," which he dedicated to Berzelius. In 1844 appeared his first "Familiar Letters on Chemistry," in the *Augsburg Gazette*. These letters were afterward published, with many new ones, from time to time in several editions, and by this means he contributed greatly to make chemistry popular, while still keeping it in the most scientific form needful. In 1850 he published a pamphlet on spontaneous combustion, on the occasion of the death of the Countess Gorlitz, who had by experts and doctors at Darmstadt and Giessen been declared to have perished from spontaneous combustion, but it was afterwards found out that she had not perished in that way, but that she had been murdered by her butler, and afterwards burned. About this time also Liebig effected a reform in the medical studies and examinations in the University of Giessen, and this reform was so important, and effected by so great a participation of public opinion, that we see there how great was his power, although in the University itself he was kept out of office as far as possible. These reforms amounted to nothing less than this—complete liberty of study. You know that in this country medical students have no liberty of study; they are obliged to attend lectures, to have heard at least two-thirds of the lectures given, and if it is not certified by the beadle, who comes in to every lecture and takes the names of all present, that they have been present at two-thirds of the lectures, they are not allowed to enter for the examination. This state of things also existed in the German Universities previous to this reformation. At that time, however, this was completely done away with, and every student was allowed to obtain his knowledge where and how he pleased. He was not obliged to enter any University whatever, but he was obliged to pass an examination, and to pass that examination publicly, an examination which should so thoroughly test his knowledge—that after he had passed it there could be no doubt whatever about his fitness to follow his profession. Now let me recommend to your attention the most remarkable system

of public examination. The remarkable effect it had on the University of Giessen was this, that whereas formerly many students, coming unprepared, were rejected, since the introduction of public examinations few rejections have taken place, because the students take great care to get up their subjects and to come so fully prepared, that in the presence of their countrymen, in the presence of any person who likes to enter the hall when the examination takes place, they can show that they are fit to follow their profession.

I have already, I see, passed the time allotted to me, and I shall not detain you many more minutes. In the autumn of the year 1852 Liebig left Giessen, having received a call to the University of Munich, where the then King Maximilian was desirous of following his father, Ludwig, on another path of glory. You know that Ludwig had made it his life business to restore art in Germany and raise it to a high footing in Bavaria, and Maximilian now wished to do the same thing for science in general, and he therefore endeavored to collect from all parts of Germany the best men whom he could attract. One of these was Liebig, the King having made him President of the Academy, with the condition that he should undertake no laboratory teaching; that he should deliver lectures only, and at the same time be the Curator of the Botanical Gardens. In that position he remained up to his death, devoting himself mainly to the public part of his duties, which he performed with grace, honor and glory, and in the laboratory which had been constructed for his own immediate wants he only performed such analyses, partly himself, and partly by a number of assistants, as were necessary to give him the data for the publication of his several works.

At last, in the year 1873, on April 18th, he died, nearly 70 years of age, and in full possession of his faculties, not having, as other philosophers have had the pain of doing, experienced any diminution of his mental powers.

A few words as to his personal appearance. He was impressive, solemn; his hair was dark; his features strongly cut; his look was piercing. His voice was somewhat low, but highly impressive. His lectures were most attractive. I remember now the intonation and nature of his eloquence, which had very few oratorical efforts at enforcement, except those which consist in repetition, and the repetition would take place at the end of important sentences. The lectures which he gave were rich and instructive; and, in fact, he sacrificed, I may say, on the altar of his lecture table, such a vast amount of his own money, that I remember Professor Bischoff, the anatomist, now at Munich, saying, in

a lamenting voice and tone, "Professor Liebig will die a poor man; he spends everything upon this laboratory and upon these lectures." The audience in the lecture-room was always very attentive; by eleven o'clock every seat was taken, every available standing-place was filled down to the door-steps, and just in front of the lecture-table there were always a few chairs occupied by distinguished strangers or foreigners. These were the only lecture-rooms which in my life I remember to have seen from the beginning to the end of the session as full as they could be. For an hour and a half everything was attention, everything went on in the most wonderful manner; at the end there was a tremendous ring of applause, and you saw the Professor disappear through a little door to his laboratory, there shortly afterwards to resume his teaching, and the continuation of those researches which were carried on by his pupils. In his laboratory teaching he knew how to attach men to him. He encouraged them to overcome difficulties, and if you look into the nearly 200 volumes of the journal entitled "*Annalen*," which he has established, you will see the enormous number of works, not only by himself, but by his pupils, which I believe would altogether reach to more than one thousand; his own contributions being upwards of three hundred. He established what may be called the first school of complete chemical analysis, upon a new system, namely, that a person who wants to know chemical analysis must perform it himself upon the articles placed before him, he knowing nothing of them; and it is only by a practical acquaintance with the process that the student is able to appreciate that which he learns in the lecture-room from the professor. Therefore the one ought to go hand-in-hand with the other, and that is now the system adopted all over the world. Do not forget that Will, the successor of Liebig at Giessen, and Fresenius, who has been for many years at Wiesbaden, were many years his assistants, and that their works on analytical chemistry are the standard works on that science throughout the world. Of course, in their work is continued work which Liebig initiated. It is the same with numbers of researches connected with the names of Strecker, Fehling, Fleitman, Guckelberger, Hemeberg, Schlossberger, Döpping, Crasso, Engelhardt, Rochleder, Theyer, Schlosser, Schlieper, Sthamer, Haidlen, Bensch, von Bibra, Bopp, Enderlin, Redtenbacher, Varrentrapp, Playfair, Stenhouse, Brodie, Bromeis, Hoffmann, and many others of equal repute—all these men learnt and studied and worked with him, as his pupils, some afterwards as his colleagues; most of them were taken by him into friendship, which continued throughout the whole of their lives.

Amongst these pupils there were but few Frenchmen. But perhaps that is redeemed by the fact that two of the most celebrated French chemists, namely, Pelouze and Dumas, worked with Liebig conjointly in some of his first researches. Liebig declined many other honorable calls to other Universities, and in 1851 even made an attempt to improve the Giessen institutions by offering to remain if the town and government would unite in improving conditions. However, nothing was done, and he left. Great surprise was experienced, when, after Liebig had left, all the other celebrated professors left the University one after another, and it sunk in an incredibly short space of time to a very low state indeed. The State and University too late perceived their loss, which they did not foresee, because even then they did not appreciate the greatness and the world-wide fame of this man. He was made a member of many learned societies, besides being the President of the Academy, and was particularly connected with the Society, in that it conferred upon him that which he wrote to me he considered one of the greatest honors of his life, namely, the Albert Medal of the Society of Arts. He wrote a letter to the President of our Society, which I am sorry has not yet been published, and perhaps I may express a hope that after His Royal Highness shall have returned from his important visit to the East, he will allow us an opportunity of participating in the sentiments which this great man has expressed to our President in that letter. A monument is now in progress which will hand down his features to future generations.—*Jour. Soc. Arts.*

THE DANGERS OF CHLOROFORM.

Patrick Conners, an inmate of the city hospital, died at that institution recently while under the influence of chloroform. The circumstances of his death give peculiar interest to his case, and make it one likely to attract the attention of the medical world to a more thorough examination of the degree of danger involved in the use of chloroform as an anæsthetic.

Conners was an Irishman of about thirty. He had been in the hospital for some days, seeking surgical treatment for the index-finger of the right hand, which had been severely crushed by an accident. He was a stout, hearty man, of much more than average vitality and strength, and not at all likely, from outward appearances, to succumb to any operation recognized by experienced surgery.

In medical technology there are four different periods through which a patient under the influence of chloroform passes. The first is called the period of excitement; the second, the period of intoxication; the third, the period of rigidity; and the fourth, the period of complete effect. Conners was very violent at first. After a few inhalations he began to shout loudly about engines and cars and wheels and tracks—calling to some imaginary person to get out of the way, and to some other imaginary person to “back fast,” and so on. He was re-enacting the scenes of his daily life, which had been that of a railroad employé. He soon became quiet, however, and his pulse and breath were closely watched by the attending physicians.

Just then it occurred to Dr. Lankford that by changing the position of the table upon which Conners lay, the requisite operation could be performed to much better advantage. A moment later and a position exactly suited to Dr. Lankford had been obtained. Meantime the chloroform had been withdrawn from Conners, and a period almost long enough for the patient to have recovered from its influence had elapsed. Dr. Lemmen was about to renew the administration of the anæsthetic, when Dr. Lankford noticed heavy stertorous breathing, under manifestly great effort on the part of his patient. The chloroform was again withdrawn and Dr. Lankford, becoming alarmed, called for his forceps, with which he quickly seized Conners’ tongue and pulled it forward, at the same time pulling his jaws apart so as to give him all possible opportunity for breath. Finding no benefit from this, the head was lowered, and all known appliances for artificial respiration were resorted to, such as moving the arms up and down, rubbing the body in different parts, but all to no purpose. The patient sank rapidly. Electricity was then brought into requisition. The batteries were applied according to the direction of the best medical authorities, but after an hour’s work it was apparent that further effort was useless. Conners was dead beyond all hope of resuscitation.

The remarkable feature of this case is that at no time had Conners been thoroughly anæsthetized. The chloroform had been administered to him slowly and with great care, and he had just entered upon the period of rigidity when its administration was entirely discontinued. His limbs were just becoming rigid when the change of position of the table above referred to caused what was intended to be only a temporary discontinuance of the drug, and it was not used again. The attending physicians were men of long experience, and of high standing.—*St. Louis Democrat.*

ON THE PRESERVATION OF THE DECIDUOUS TEETH.

Read before the Virginia Dental Association, by N. Marshall Burkholder, D.D.S., Harrisonburg, Va.

The first ten years of the child is too apt to be a period of neglect, as it respects the teeth. The fact that the first teeth are soon lost, or rather must soon give place to others, accounts, I suppose, in some measure, for the little attention they have commonly received from dental practitioners and from parents as well.

It is very easy, however, to get into the habit of crediting the general public with very much more knowledge on these subjects than they actually possess ; and to forget that a far more important reason of the neglect of the teeth of children is found in a want of acquaintance with those facts of physiology which proclaim the importance of their preservation.

Very many parents, in my experience, possess only enough acquaintance with this general subject to know that their children "*will get other teeth*" when the milk teeth are gone. They have no idea of a regular period for their appearance, which will not be hastened, but rather retarded, by the untimely loss of the first teeth. They have never given any thought to a consideration of the conditions necessary to the formation of the permanent teeth, or to perfect nutrition and vigorous growth. They have scarcely noticed an increased number in the second set. How common the dialogue in every dental office with regard to the first permanent molar : Parent referring to child—"He will get another tooth there." Dentist—"No ; that is one of the second set." Parent—"Why, he has never lost that tooth yet."

The great masses of the people know nothing of these things. It is not because they are lacking in intelligence that they suffer so much from carelessness and neglect, but because they are so busy in the pursuits of life that they cannot spare time, they imagine, to read and study the laws of hygiene and physiology. They have all the indifference of our grandfathers, without, however, having our grandfathers' teeth. And what is more, they are not to be expected to inform themselves on these subjects until their importance is pointed out to them, and their attention is in some degree awakened.

There has undoubtedly been great neglect on the part of the dental profession, as a whole, in this very important sphere of our labors. The attention of the people in many communities has scarcely ever been called to the importance of the preservation of the deciduous

teeth ; to the importance of a careful observation of the mouth during the entire period of the eruption of the permanent teeth, and of the timely correction of incipient irregularity.

It is to this matter I wish particularly to direct the attention of our Association. I regret that I cannot reach the ear of every practitioner in Virginia. For it often happens that the members of our Association, least of all, need these exhortations. They are commonly alive to their duties, and very often far in advance of the speaker who is urging them forward. But let me say, if the dental profession would discharge its obligations in the highest sense, it must instruct as well as practice. We must be teachers as well as surgeons. I fear exceedingly that, as a people, we are neglecting the teeth of our children, and I believe that dental surgery will have to look and labor more in this direction in the future than it has ever done in the past.

It is gratifying, however, to note the fact that so many at this day are turning their attention to this class of teeth. The inquiry is arising in many minds, "Is there not something more to be done here, and how shall we reach the children?" It is beginning to be perceived that all truth is correlated ; that the beginning of things are usually the most important. No subject, however trivial or slight its relation to other subjects may at first blush appear to be, is to be despised by him who would attain those truths which in anywise concern the happiness of man.

The period of childhood is so much characterized by bloom, and promise, and rapid growth, that it is hard to think of a necessity of guarding against decay. Besides, it has never been customary to give any attention to their teeth. "Who ever heard of such a thing !" occurs to every one. But the ruling fact of a greatly inferior structure of the teeth of children of to-day, as compared with their parents or grandparents, stares us in the face, and necessitates that care and attention which our ancestors could do without.

Not very long ago it was exceedingly rare to find a dentist who was much exercised about the teeth of children. But may we not reasonably hope we are fast nearing the time when the dental profession, as a whole, shall enter this wide field ; and when the children now the subjects of universal mighty effort in the domains of the heart and head, will have enlisted in their behalf those efforts which are calculated to promote their physical well-being and therefore their comfort and happiness?

I lay down the proposition, which will commend itself to every one,

that if nature intended the deciduous teeth to be a substitute for the teeth which should be permanent, until the system is able to bring forth these permanent teeth, then it is our duty to preserve them as long as they are wanted, according to this design of nature. And I venture to assert, on the principle that no design of nature or function of an organ can be thwarted or destroyed without influences more or less hurtful to other organs, and to the general system, that the invasion by diseases of these organs (the first teeth) and the premature loss of their function is to the no slight detriment of the system. The principal function of the teeth is mastication. The preparation of the food for digestion—for absorption and assimilation, lies at the very beginning of the process of healthy growth, or rather of the conditions necessary thereto. We perceive the necessity of requiring that the infant taken from its mother's breast, as it begins an independent existence, should be fed on food which requires no teeth for its preparation for the stomach. Food which has been elaborated through the operation of the teeth of another has hitherto been its support. As the teeth are erupted its ability to partake of more solid food is correspondingly increased. Before its second year, however, the child has no business at the table with the rest of the family. About the end of the third year it may, if taught by considerate parents to masticate well, subsist upon any solid food, the deciduous, or temporary, the first or milk teeth, as they are variously termed, being now usually all in place.

We are now entering upon a critical period in the history of the child in respect of its physical development. This is peculiarly the formative period. The most rapid growth of brain occurs between the ages of three and ten. I believe it to be true in a physical as in a moral sense, "Give me the child at three years old, and when he has lost his milk teeth you may make what you please of him." It is the period of greatest impressibility. The slightest force gives new direction to the currents of life and character; the slightest impediment may hinder and clog its delicate mechanism. Inferior mastication here makes bad digestion, and this impairs nutrition, and nervous disorder ensues with lowered vitality. Such a state childhood's innumerable ailments find most readily; and here disease reveals with least opposition. If, however, all the offices of the various organs continue to be healthily performed, if there be exercised a judicious care to favor a uniform and harmonious development of the physical and of the nervous systems, counteracting here and promoting there such prominent inherited tendencies as are observed, we may expect a well-developed, well-balanced organization, health, vigor and happiness.

I frankly admit that I have here introduced a saving of great potency. I believe that that acute observer, Prof. Kingsley (witness his September article, "*American Journal of Dental Science*,") has pointed out to us some important facts in this connection, and further that he has discovered to us the method of approach to others. It has for many years been the declared opinion of the first educators, and of the first medical men, that the intellect of the child should not be pushed; that the physical system should have fair play between the fifth and tenth years. In other words, that a solid substructure of body should be first provided, and on this erected the brain.

We have but to look about us with the most casual glance to perceive that the tendency to excessive nervous development is on the increase. Why, sir, there is such a thing as attaching too much importance to education; and this is one of the evils of it. In the sphere of religious effort intellectual endowments sometimes come to be considered before spiritual endowments. "Mind over matter" has been so persistently hung up in letters of green on brilliant commencement occasions, that many a young man has half wished himself out of the body, and has thought it matter for praise that he has actually reduced his body to the lowest minimum.

This atmosphere has been so much breathed that it is to be feared "mind" has sometimes come to appear to be "over matter," like the figure of liberty on our Virginia coat of arms is over the tyrant who lies crushed and despised at her feet. Everything has its limits; it will not do to disturb the natural relation of things. Mind is over matter, but still connected with it. And our bodies are not to be lightly esteemed. They evince the masterly workmanship of a Master's hand. They bear the stamp of divinity. And it becomes our duty, our first duty as between the physical and the intellectual, to preserve this body and each and every of its members. Especially is it seen our first duty when we consider that through the medium of the body the mind manifests itself.

Except under infatuation the human mind always acts upon this conclusion: "Self-preservation is the first law of nature." But the spirit of infatuation is abroad. Throughout the entire frame-work of modern society, in all its channels and intricate under-currents, everything is on a *strain*.

I am reminded in this connection of the humorous and original Prof. Thos. E. Bond, who, in speaking about what he termed the "emasculate practice of the times," in displacing the lancet, and in its

reliance upon that great class of remedies known as stimulants, remarked that the present practice seemed to be based upon the theory that "*Life is a forced state, and whisky, a forcer.*"

An undue development of the brain and nervous system occupies an important place in relation to irregularity of the teeth, imperfect tooth structure, and to the deterioration of those qualities of the human frame which capacitate man for endurance. That relation is entitled to be declared one of the recognized facts of dental science of to-day. It affects all children in precise correspondence (other things equal) with their transgression of the laws of normal development, in acceding to the wrong demands of civilization, the natural tendency of which is in laboring for the development of the mind not to give enough thought to the highest development of the body.

Premature mental exertion dwarfs the physical system by robbing it of blood and of nervous force, thus impairing the digestive and nutritive powers which have to do with growth. But *mastication* being a condition upon which digestion depends, if it be wanting or imperfect it will, by so much, inevitably tell upon the digestive capacity, and in the general results of nutrition and of organic structure, the brain itself included. In this way the digestive apparatus is overworked; in the former it is robbed of its power. In both, its powers are diminished. In the one case you overstrain the brain, which draws upon the entire system for its support; in the other you overstrain the stomach, producing general relaxation or diminution of vigorous tone.

These are sober facts which should be read and pondered by parents everywhere. It is no less our duty to bequeath to our posterity a vigorous body than a vigorous mind. In truth, the highest effective capacity of mind, other things equal, must ever be linked to the highest physical development.

Now if we consider the earnest demand for vital power in the growing child, coming from very rapidly forming tissue and organ, we begin to perceive the serious nature of the least unnatural action or derangement of the function of digestion and other conditions of supply. And then with this, taking into view the tendency to excessive nervous development, the results of which—an abatement of the vigor of the nutritive forces, and a lowering of the forming constitution—are increased and intensified in force by inheritance from generation to generation, it seems to me it ought to be considered all-important to preserve in perfect order the masticatory organs; to preserve always all the conditions directly concerned in the up-building of the physical system, but

especially when an influence so potent is operating to hinder and weaken and drain away its powers.

The deciduous teeth form a most necessary part of nature's laboratory in a most critical period of her labors. They should receive the attention of parent and dentist, until, one after another, they are displaced by their successors. The very gradual method of natural displacement, which makes the period of their disappearance scarcely felt as it regards the power of mastication, should teach us that nature foresaw she could not spare them. It ought to be regarded quite as serious a matter to lose a deciduous tooth as a permanent tooth. It ought to be held an important matter, not to be neglected, to have a child continuously refusing to chew on one side of the mouth on account of the presence of a diseased and sensitive tooth. Who has not seen it? Permanent injury to all on that side ensues. Apart from the suffering and its general depressing effects, affected glands, vitiated saliva, imperfect digestion, more or less, make up a sad, and what is worse a useless, picture. Or if the teeth are lost, by so much precisely as the power of mastication is reduced and its proper performance hindered, will the process of nutrition and healthy, vigorous, perfect structural formation be impaired as the ultimate result.

Who is prepared to demonstrate it a small matter to have an inferior digestion during this period of peculiarly rapid development, unattended though it be by any disorders visible, save those affections of the blood and skin so common to the young?

During this period of rapid growth of bone and muscle and nerve, the formation of the permanent teeth is also steadily progressing. The forming teeth seem to possess a peculiar sensitiveness in the presence of constitutional disorder. Take, for instance, the case of atrophy of the teeth. Where in other structures of the body are the corresponding marks of those constitutional disturbances which produce it? The teeth seem to be developed on the remotest limits of vital flow, and the delicate threads and silken fibres of their existence are made to tremble and pale at the slightest ebb.

If good mastication and good digestion be important at any time—if the conditions necessary to the most perfect nutrition and most healthy growth are important at any time of life, are they not especially so during this period? “The child is father to the man.” What if nature, kind mother, has furnished the child these teeth with which it may, as it were, work out for itself others whose structure shall be so much more enduring as the conditions under which they are formed

are superior to the conditions under which the first were formed. How lamentable the reflection that in so many instances these conditions are permitted to be so little superior to the first. The buoyant forces of nature, as they go on to fill up the stature and complete the structures of the body, are not easily overcome; but the secret and destructive influences they experience are not the less real because they are unseen.

The presence of the deciduous teeth and the proper performance of mastication has its natural relation to the healthy formation of the permanent teeth, and we are bound to treat the deciduous teeth with this fact in view.

Considerations like these should require nothing supplemental to discover to us our duty. It should be added, however, that the preservation of these teeth has an important bearing upon the natural and orderly placing of the permanent teeth. Their premature loss in certain contingencies, occurring in almost every mouth, is followed by *irregularity* and *crowding* of the permanent teeth. Every parent should seek to avert this calamity. For a crowded condition of the teeth is one of the great predisposing causes of decay.

Not the least of the benefits to be derived from the preservation of the deciduous teeth is the habit of cleansing the teeth with brush and quill daily. Perhaps the most lamentable want of our times, in connection with this whole subject, is *the habit of cleansing the teeth*. Habit, to be firmly fixed, must be begun early. *It has come to this, that every wise mother must make it a part of her duty to see to it that her children are taught to use the Brush as soon as they are taught to wash their faces.*

The habit of giving attention to the teeth thus early begun, coupled with the necessary instruction and advice, serves not only to fix impressions of their frailty, but also of their value. And thus a strong sense of duty, the safeguard against neglect, is early attained and never lost. The brush should be used at least morning and evening—deferred in the evening until just before going to bed. The teeth are thereby freed from whatever may have been taken into the mouth after supper, fruits, etc., and acid secretions. No money pays better than that put into tooth brushes. But the brush must be aided by the quill. There are points in perhaps every mouth where solutions of food, or other acidulated matters, cannot be disturbed with the brush. The quill breaks up these nests on proximal surfaces. The use of brush and quill is not a burden; it becomes a matter of comfort, and one does not feel well without them.

I have a little boy, aged nine, who has been using the brush daily since he was four years old. Two of his first teeth have been filled, and none of them have been lost, except in the natural process of displacement.

There is too much indifference to the wants of children, because they are children. Children are almost universally allowed to neglect their teeth because of a lack of decision in parents in enforcing the regular use of the brush. And in many cases the dread of a small expense—small in the majority of cases where the habit of cleansing is observed—is the obstacle in the way of their preservation.

By urging the habit of cleansing, by frequent examinations, by judicious separations, and by fillings, it may be with the cheaper materials, with very short sittings, we must preserve the children's teeth. It requires patience, gentleness, and strict truthfulness to treat with children. And what is more, the decided support of the parent.

As the people are made acquainted with these particulars they become more careful of their teeth, and of the teeth of their children. Our profession should endeavor to gather up the truth on these subjects, and disseminate it. This, if I understand it, is one of the benefits resulting from Associations like this. There is great sale for small, judiciously prepared popular treatises on these subjects. Education is the one idea of the day. While the popular mind is being drawn out in other departments of useful knowledge, we must provide the needed information in this important field.

For forty years our profession has labored with unabating effort to convince the world of the importance of the teeth, and of the necessity of educated and skilled men to assist the people in preserving them. You have successfully demonstrated it to men of science and to the masses alike. You have humbly, quietly, and yet resolutely, and by the effective aid of many of the medical profession, demonstrated the importance and the possibility of preserving the teeth. You have lifted it from a position of vague uncertainty and non-attention in which it was regarded, and have shown that the teeth stand closely and influentially related to the human system.

But we have work yet before us. In the heat of the contest there seemed to be little time to attend to the children. We thought little about them, and did less for them. The great public see now the importance of preserving *their* teeth. *But they do not yet generally understand that we have a mission to their children.* The time has come when we must advocate the cause of the children.

It is the high duty of the dental and medical professions alike to endeavor to acquaint men with the great fundamental laws of health and of disease, and with the facts and conditions upon which disease in general depends.

The diffusion of much knowledge tends not only to diminish the accidents of disease, but, through an intelligent apprehension of disease once begun, secures more apparently the needed professional assistance, provides against relapses, and thus multiplies the success, and enhances the character and dignity of the healing art.—*American Journal of Dental Science.*

SINKING OF AN HOTEL INTO THE EARTH.

The St. Louis *Journal* relates the following occurrence that happened in that city on May 12: "Considerable excitement was created in East St. Louis yesterday morning, on the discovery that Belleville House, a two-story frame building, just south of the Pittsburgh Railroad and Coal Company's dike, near the southern limits of the city, had disappeared in the quicksand. The circumstances connected with the unusual occurrence are as follows: The house, which is used as a hotel, was built on piles, and but a few days before showed evidences of an inclination to sink into the earth. On Thursday night it sunk about two feet; but the proprietor, Mr. F. Decker, not apprehending anything serious, paid very little attention to the matter. On Friday night the guests went to bed as usual, but at a late hour the clerk, Mr. George Huebner, discovered that the premises were getting rather unsettled, and gave the alarm. Before the inmates could realize what was going on the building had sunk forty-eight feet, carrying with it ten persons. After considerable difficulty they were all rescued, badly frightened but not hurt. The back water from the river soon surrounded the place where the house stood, and would very probably have carried it away if the gable end, all that is visible, had not been securely fastened to *terra firma*. Mr. Decker's loss on the building is about \$6,000, and on furniture about \$1,000. The house was recently purchased by the present proprietor; and in all probability it entirely disappeared last night, as very little of it was visible at a late hour."

“WAYS THAT ARE DARK” NOT CONFINED TO THE
HEATHEN CHINEE,

AS SHOWN BY A LETTER TO THE EDITOR OF THE *British Journal of
Dental Science.*

SIR : At the meeting held at Manchester on the 6th inst. a gentleman made the observation that the Pharmaceutical Society could not obtain the ear of Parliament until strong representations were made on the sale of poisons, then it was that there was sufficient reason shown for an act of incorporation of that body in the interest of the public.

Well then, sir, in reflecting on that observation, a circumstance occurred to my mind which I think is a strong reason why the Dentists should be favored with an act of incorporation.

Mr. C——, a respectable farmer, called upon me several years ago with reference to a gold piece which he desired to have remade, and which was arranged to be done by a certain date. The piece was mounted with flat teeth. To my surprise, when the teeth were taken off and the plate passed through the fire all the gold had disappeared, and nothing was left but a *brass* plate ! I wrote the gentleman a letter stating the fact, and that I could not go on with the piece, and told him he was at liberty to use the letter in any way he thought best. Well, sir, within a very short time I came across several other pieces made of *brass*, in the same way and made by the same party, the only difference being that the whole of the gilt was worn away ; and I proved to the parties by the nitric acid test that they were wearing nothing but brass pieces, that in fact they were subjecting themselves to a process of *slow poisoning*. A repairer of jewelry frequently sold to the maker of these spurious pieces brass and German-silver brooch pins, to whom he made boasting remarks that his patients would know nothing about it.

It is all very well to say that the public have their remedy in such a case ; they would have if there were any funds, but, unfortunately, in this case there were none, as he was hopelessly insolvent, so that to prosecute was worse than useless.

For very obvious reasons I cannot give names, *but* I can verify my statements. Well, then, my point is this, that if the Dentists had had a charter of incorporation and a code of ethics which should regulate and enforce honorable practices, that then the public would be protected, and the party who was guilty of practices at once *fraudulent, degrad-*

ing, immoral and poisonous could at once be brought to book and struck off the list of persons entitled to practice as Dentists.

It is obviously apparent that in the present *disintegrated* state of the profession it is impossible to bring to bear effectively any restraining influence against improper and degrading practices such as are described above, and the only conclusion is when such things are brought to light the whole profession rests under a stigma, for the public don't stand over-nice in their conclusions.

If this letter should help in any way to advance the cause of Dental Reform then my purpose in writing it will be answered.

I am, etc.,

PRO BONO PUBLICO.

THE CAUSE OF DECAY OF THE TEETH.

In a paper read by Dr. S. B. Palmer before the New York Odontological Society (Dec. 21st, 1875,) will be found the results of a series of experiments, having for their object the production of decay by artificial means in the form and manner in which it occurs in the mouth. The paper is too long to quote in full, but a good report of it will be found in the "Cosmos" for May, 1876. There is one special point in this series of experiments which, but for a verification from a totally different stand-point, might be doubted by most operators; certainly it completely upsets the generally conceived notions with regard to the cause and prevention of decay, and, if correct, which I do not for a moment doubt, both our theory and practice must be altered. The conclusion come to by Dr. Palmer is, that he was unable to reproduce decay as it is seen in the mouth by the action of acids, but that he *did* reproduce it by alkalies. With the assistance of an electric current acids simply acted on and destroyed the whole of the enamel. Repeating the experiments with an alkaline solution, he states, "I obtained the characteristics of decay which are found in the mouth." As a curious and indirect verification of this (to many) unexpected result, it will, perhaps, be remembered that some time ago I made a great number of comparative tests of solubility between oxychlorides and the enamel of freshly extracted teeth. In acids, both mineral and organic, the action was greater on the tooth enamel than it was on a good oxychloride, but when the same experiment was tried with alkalies the action was not only reversed, but the comparative destruction of any and every oxy-

chloride tested was tremendous. Now we come to the fact that in many cases every oxychloride fails in practice notwithstanding its great insolubility in acids, and we are driven to the conclusion both by this and Dr. Palmer's experiments to acknowledge that the destruction of teeth as it occurs in the mouth, and also the destruction of oxychlorides, is not caused as has generally been supposed by acids, but by an alkaline reaction. It is hard to have to go back and acknowledge our theories are completely the reverse of what they should be. At the same time, these two independent sets of experiments, both bearing on the same matter from two totally different stand-points, must, I think, cause a serious change in the theory and practice of conservative Dentistry.—THOMAS FLETCHER—*British Journal of Dental Science*.

A REMARKABLE SURGICAL OPERATION.

About two years ago a waiter in a Parisian restaurant undertook to imitate the feats of the Chinese sword swallows, by introducing a fork, handle foremost, into his throat, taking care to hold the tines in his teeth. The attempt was successful, and a repetition was demanded by the loungers in the saloon. The man complied ; but while the fork was in his œsophagus, one of his comrades made an ill-timed joke; the performer grinned, let go the fork with his teeth, and down it went. The pain was intense. A physician was summoned, who managed to seize the fork with a forceps ; but just as he was drawing it up, the patient was seized with convulsive coughing, the doctor was compelled to relax his hold, and the fork slipped down all the way to the stomach. The symptoms of asphyxia at once disappeared, and the man suffered no inconvenience for about two weeks. At the end of that time, however, severe gastric affections manifested themselves, and the patient was sent to the hospital, where he has since, until last month, remained, suffering great agony.

In the month of October last it was decided by the hospital physicians to practice the extraordinary operation of gastrotomy, that is, to cut directly into the stomach and extract the obstacle. It was at first attempted to determine adhesions of the viscera from out, inwards, by means of caustics ; but this not succeeding, a triangular zone, wherein no essential organs were included, was selected as the point

of perforation. In April the incision was made, the layers of tissue being dissected away one after another. The envelope of the stomach was attained, cut, and a piece removed. The stomach itself was then opened, and pincers introduced, and after a few attempts the fork was grasped and withdrawn. The wound was closed and is now nearly healed, the patient suffering only from a slight stomachic fistula, already in process of obliteration. The fork was perfectly black, but otherwise unchanged.

PNEUMATIC TUBES IN NEW YORK.

During the past week a large number of men have been engaged upon Broadway in putting down lines of pipe for telegraph wires and in laying pneumatic tubes. The proposed method of transmitting messages being somewhat novel, a description of the process may be of interest. The tubes, four in number, are laid parallel to each other and near together in the bottom of a trench about three feet deep, and directly above them, one foot nearer the surface, are the iron pipes through which telegraphic wires will be drawn. The former separate into pairs soon after leaving head-quarters at the Union Telegraph Building (where a powerful duplex steam engine is stationed to exhaust or supply the atmospheric tubes), two pipes going down Maiden Lane and thence to the Corn Exchange. The other two will extend down Broadway and Wall Street to the Stock Exchange. In a short time entire sets of pipe and tubing will be extended northerly through Broadway, connecting, in their progress, with various hotels and other prominent places as far up as the Brunswick Hotel, taking in their course the Grand Central Depot. Each of the pipes for telegraphic purposes will contain from 50 to 100 wires, the number depending on the necessities of business. In operating the pneumatic tubes the message is taken precisely as written, put bodily into the carrier, and shot through to the central office. The transmission is almost instantaneous. For example, the time from Dey Street and Broadway to Broad Street is calculated at 20 seconds, or from Dey Street to the Fifth Avenue Hotel 54 seconds. At the further extremity of the tube there will be a small circular opening in the wall, from which the message may be sucked by the pneumatic power applied at head-quarters. The other tube, where the message is received, will simply curve toward the flooring, with a basket beneath to catch the missive in its flight.

The brass tubes, which we had an opportunity of inspecting not long since, are very fine and seem admirably adapted for the purpose. The whole of the tubing, we understand, was furnished by the National Tube Works, of Boston.—*Iron Age*.

OBITUARY—DR. A. BERNARD.

News was received yesterday of the death of Dr. Aldis Bernard, ex-Mayor of Montreal, at San Jose, California, where he removed from this city about ten weeks ago, for the purpose of permanently residing. Though ailing slightly for a few days previously, yet his decease on Monday was unusually sudden. Dr. Bernard was a native of the Province of Quebec, having been born on the shores of Lake Memphremagog. When yet a child he was taken to the United States, and eventually took up the profession of dentistry, in which he soon became a skillful practitioner. He practiced about ten years in the Southern States, itinerating as was then the fashion with dentists. In the summer of 1839-40 he came to the North, in consequence of ill health, and spent some time at Niagara, on the shores of Lake Huron and other parts of Ontario. In the autumn of 1841 he came to Montreal, where he remained in constant practice till within a late period. In 1844, when Montreal was the seat of Government, Dr. Bernard made an effort to improve the condition of the dental profession by legislation, which was very nearly successful, when the Parliament buildings were burned, and the medical act, in which were included the clauses regulating dental practice, was destroyed. In the late successful incorporation of the profession in the Province of Quebec, and in every associative movement designed to educate and elevate, Dr. Bernard took a leading part. He early manifested an active interest in public matters; was President of the Mechanics' Institute, and for more than sixteen years was connected with its management. He was a member of the Natural History Society, and one of the founders of the Society for Prevention of Cruelty to Animals, and honorary dental licentiate of Ontario, Honorary member of the Ontario Dental Society, etc. For a long series of years he was an earnest Freemason, was one of the principal founders of the Grand Lodge of Canada in 1855, and the first Deputy Grand Master. At the time of his death he held the rank of past Grand Master. Dr. Bernard was in 1858 elected a member of the City Council for Centre Ward, and held his seat till 1873, becoming Chairman of the Finance Committee.

Upon the death of Mayor Cassidy, he was chosen by his fellow aldermen to fill the Chair of State, and was re-elected the ensuing year, resigning at the close of the term in favor of Mayor Hingston. He was a man of persistent determination, and often carried his point in face of strenuous opposition. He materially aided in passing the City Passenger Railway Co.'s by-law, and the Montreal, Ottawa and Western Railway million dollar grant, also the Sunday liquor law. His latest dispute was in regard to his seat on the Harbor Board, which position he never resigned, which, however, he was willing to do as soon as the city had legislated for his replacement. He was President of the Dental Association for this Province, and was a member of the firm of Bernard & Lovejoy, retiring in Dr. Lovejoy's favor a year ago last May. He never got over his poignant grief at the death of his eldest son, which sad event occurred in February, 1875. He was a member of Dorchester Street Methodist Church up to the time of his departure for California, was an able and ready speaker, an energetic worker, and made his mark in whatever sphere he acted. He leaves a wife and family of seven to mourn his decease.—*From a recent Montreal Newspaper.*

DR. E. W. ROBBINS.

The many friends of the late well-known and popular dentist, Dr. Edward W. Robbins, will be grieved to hear of his very sudden death, at five o'clock on Friday afternoon, at his late residence corner of College avenue and Richardson street. For some time he was in poor health, but nevertheless attended to his professional duties. He suffered more than usual during the past few days, and on Friday afternoon quietly passed away.

To say that he will be mourned by the citizens of New Brunswick is only to express a small amount of the sorrow which we all feel. His career in this place, as a dentist, is well known. He certainly was most skillful and trusted in his profession and always possessed a very large practice. Dr. Robbins was beloved by New Brunswickers and collected a host of friends. He was the most perfect type of a gentleman we ever saw.

Everybody who knew him liked him and spoke well of him. It will be long before a successor takes his place in the affections of our citizens.

Dr. Edward W. Robbins was born in Bordentown, and, at the time of his decease, was in his forty-first year. He received a good education. About eighteen years ago he was graduated from the Pennsylvania Dental College in Philadelphia. After receiving his degree, he located in Georgia, where he soon secured a large practice. During the Rebellion he came North and established himself in our city. He became associated with Dr. A. D. Newell, remaining with him until the latter retired from practice, about eight years ago. During this time he had made a well-earned reputation, which insured to him a large practice to the day of his death.

The Doctor was married about five years ago, and our most heartfelt sympathy is expressed for the widow, who, during the past few months, has been called to mourn the loss of husband and their only two children.
—*From a New Brunswick (N. J.) Paper.*

AMERICAN DENTAL ASSOCIATION.

The sixteenth annual meeting of the American Dental Association will be held in accordance with a resolution adopted at Niagara in 1872, and ratified at the same place in 1875, in the city of Philadelphia, commencing on Tuesday, the first day of August, 1876. The sessions will be held in the chapel of the church at the south-east corner of Broad and Arch Sts., a central and convenient locality. It is expected that representatives of the profession from abroad will be present, and all delegates from local societies, as well as other members of the profession, in the United States and elsewhere, who may contemplate a visit to the Centennial Exhibition, are earnestly urged to arrange their plans with reference to attending this meeting, which it is hoped will be of unusual interest. C. STODDARD SMITH, *Recording Secretary*.

AMERICAN ACADEMY OF DENTAL SCIENCE.

The ninth annual meeting of the American Academy of Dental Science will be held in Boston, on Monday, September 25th, 1876, at 10 o'clock A.M.

The annual address will be delivered at 2 P. M., by Dr. Robert Arthur, of Baltimore.
E. V. HARRIS, *Cor. Secretary*.

NOTES.

Pennsylvania State Dental Society.

The Eighth Annual Session of the Pennsylvania State Dental Society will be held at the Pennsylvania College of Dental Surgery, South-east corner of 10th and Arch Streets, Philadelphia, Pa., on July 26th, 27th and 28th, 1876.

The session will commence Wednesday, July 26th, at 10 o'clock A. M., and continue three days. A microscopic exhibition will be given in the Philadelphia Dental College, 108 North 10th Street, Thursday, July 27th, at 8½ o'clock P. M. The Executive Committee announces the following programme :

ESSAYS AND CLINICAL OPERATIONS.

"Neuralgia—Its Relations to Dental Irritation," by J. H. McQuillen, M.D., D.D.S., Philadelphia, Pa. "Conservative Dentistry and Conservatism in Dentistry," by W. E. Magill, D.D.S., Erie, Pa. "Dental Progress, Failures and Successes," by F. M. Dixon, D.D.S., Philadelphia, Pa. "Capping Pulp," by J. S. King, D.D.S., Pittsburgh, Pa. "Food," by T. F. Chupein, D.D.S., Philadelphia, Pa. "The Dentist's Obligation to his Patient," by S. H. Guilford, D.D.S., Philadelphia, Pa. Papers forwarded from local Societies. Address by the retiring President, E. T. Darby, D.D.S., Philadelphia, Pa.

"Surgical Clinics," by C. N. Peirce, D.D.S., and J. E. Garretson, M.D., D.D.S., Philadelphia, Pa. "Operation, Illustrating the Use of a New Automatic Mallet," by T. C. Stellwagen, M.D., D.D.S., Philadelphia, Pa. "Operation, Using the 'King Dental Malleter,'" by J. G. Templeton, D.D.S., Pittsburgh, Pa. "Illustration of the Use of the Matrix," by C. S.

Beck, M.D., Wilkes-Barre, Pa. "Restoration of Contour by the aid of the Electro-Magnetic Mallet," by M. H. Webb, D.D.S., Lancaster, Pa.

Edwin T. Darby, President ; Marshall H. Webb, Corresponding Secretary.

Executive Committee : R. Huey (Chairman), R. H. Moffitt, C. N. Peirce, S. H. Guilford, M. H. Webb.

The Teeth of Americans.

An Englishman named Charles A. Cole has recently written a book about America, in which is found, among other paragraphs, the following : "Two or three dentists may be found in a village with less than 800 inhabitants. The very common consumption of candies and lollipops by grown up women leads to frequent attendance on the dentist, and the younger male and female children soon begin to follow the fashion of their elders. Coming out of New York on the Hudson River Railroad in a drawing-room car—that is its fitting name, for it is a "drawing-room" on a car—out of a bevy of five handsome grown up girls three were filling up the pauses in reading serials or newspapers by sucking sticks of candy with open and undisguised satisfaction. The candy shops in New York are a marked feature in the streets, more so than in Paris, Vienna or Milan; there are many at which candies and sugar stuff, chocolate *bon bons* and their varieties are alone obtainable. Nothing else is sold in the stores. At their country dances and gatherings the swain approaches the beloved object with candy in one form or other, and it is certainly a pleasant and sure mode of arresting the flow of a lady's tongue."—*Herald*.

New Food for Silk-Worms.

It has been determined by accidental experiment in Wurtemberg that lettuce is apparently as good food for silk-worms as are the famous mulberry leaves. In the summer of 1873, according to a writer in *Das Ausland*, a few silk-worms were fed with lettuce some time after being hatched, no other food being obtainable. When the season was about half over mulberry leaves were substituted, but during the time of the lettuce diet the caterpillars ate ravenously. Cocoons were spun by the moths as usual. The next spring it was decided to feed the silk-worms only on lettuce. Care was taken to leave no moisture on the surface of the leaves, which were devoured by the young brood in great quantities. The few deaths that occurred were attributed to carelessness in not wiping the food dry, and most of the insects grew and went through their metamorphoses in the usual manner. The cocoons were of good quality, and it is intended to exhibit them at the Royal Agricultural Hall in Stuttgart. This record of a successful experiment is worthy of more than a passing notice in this State. If lettuce leaves are really as good food for silk-worms as mulberry leaves are, one great drawback to the successful culture of silk in California — lack of food — disappears. Lettuce can be produced at any place, even in the foothills and in the high Sierras, in quantities to suit, at little cost, and is easily gathered. Of course time alone can determine whether or not silk-worms will degenerate on such diet. It is to be hoped that some of our sericulturists will notice this article, and will make local experiments for their own and the public benefit.—*San Francisco Post*.

Extraction of Foreign Bodies from the Ear.

Dr. W. Rivington (*Brit. Med. Jour.*, March 18, 1876) takes the following steps in the procedure of removing foreign bodies from the ear :

1. Examine the ear carefully by direct light and with the speculum and mirror, to determine the presence, position, size, nature and peculiarities of the substance.

2. If the patient be a child, and refractory or timid, place him on a couch, give ether or chloroform, and use the syringe, turning the affected ear downward. This manœuvre may be aided by drawing the auricle upwards and backwards, and applying the nozzle of the syringe to the upper wall of the passage.

3. If the foreign substance does not fall out, as it usually does after a little patience, but stops near the orifice of the meatus, a fine pair of forceps may be used to draw it out.

4. A needle or pin, or other elongated body which does not fill the passage, may be readily taken out with forceps through the speculum or by the aid of direct light.

More about Gallium.

The last *Comptes Rendus* contains some additional facts in regard to this curious metal, which are due to M. de Boisbaudran. Pure gallium melts about 29.5° , and can be liquefied when held in the fingers, and remains quite readily in a state of superfusion, which explains how a globule remains in the liquid state of temperatures falling at times below zero. When solidified the metal is hard and resistant, even at temperatures little below its melting point. It is sectile, and possesses a certain degree of malleability. When melted gallium adheres readily to glass, on which it forms a mirror whiter than that produced by mercury. When heated to a bright red gallium is only oxidized superficially and is not volatilized, which latter fact is very curious. When cold it is not sensibly attacked by nitric acid, but with the acid of heat gallium dissolves with the evolution of red fumes. Its specific gravity is 4.7, the mean specific gravity of aluminum being at 0° , 4.8.

Primitive Man.

The late Prof. Wyman, in an able article on the shell mounds in Florida, argued "that the steady progress of discovery justifies the inference that man, in the earliest periods of his existence of which we have any knowledge, was at best a savage enjoying the advantages of but few of the newest inventions." The term "primitive man" Prof. Wyman thought to be a misnomer, if intended to be strictly applied; because the earliest traces thus far discovered do not reveal to us his beginning. "This is still hidden," Prof. Wyman states, "in that mysterious past out of which he has emerged, and into which neither science nor exploration has as yet penetrated." Geology, in fact, fails to reveal to us our actual beginning, for, as Cuvier writes, "the places where he [man] dwelt may have been utterly destroyed, and his bones buried at the bottom of the existing seas."

How do Nerves Transmit Impulses?

Dr. R. McDonnell (*Medical Times*, Jan. 8, 1876) answers this question as follows: "I conceive that the various peripheral expansions of sensitive nerves take up undulations or vibrations, and convert them into waves capable of being propagated along nervous tissue. Thus the same nerve-tubule may be able to transmit along it vibrations differing in character, and hence giving rise to different sensations; and consequently the same nerve-tubule may, in its normal condition, transmit the wave which produces the idea of simple contact or that which produces the idea of heat, or, again, the same nerve-tubules in the optic nerve which propagate the undulations of red, may also propagate in normal vision those which excite the idea of yellow or blue, and so for the other senses."

Glosso-Pharyngeal Nerve.

Its Vaso-Dilator Action on the Vessels of the Mucous Membrane at Base of Tongue.

A. Vulpian (*Compt. Rendus—London Medical Record*, Nov., 1875) shows that the glosso-pharyngeal is the vaso-dilator nerve for the posterior parts of the lingual mucous membrane, just as the chorda tympani is for the anterior part of the tongue. Electrical stimulation of the glosso-pharyngeal produces intense redness of the part of the tongue supplied by that nerve. Further, the author has convinced himself that, after destruction of all anastomoses, this action of the glosso-pharyngeal nerve remains the same.

The Pneumatic Railway in Paris.

The *poste atmospherique*, for the dispatch of messages between Paris and Versailles, has just been completed, and is nearly 13½ miles in length. The tubes, which are made of brass, are 13 feet long, 3½ inches in diameter and two-fifths inch thick, are laid at a depth of 8 feet from the surface, on a flooring of wood, and are pitched both inside and out. The route outside the walls of Paris is along the highway No. 10. Inside the city they are suspended in the sewers. At the bridge de l'Alma the tube bifurcates, one portion passing to the Palace de l'Elysee, the other to the Central Telegraph Office. At Versailles the terminus is in the new hall now being built on the left wing of the palace.

The mortality of the globe is 42,403,000 yearly—115,200 per day, 4,800 per hour, 80 per minute. Of 10,000 persons, 1 reaches 100 years, 1 in 500 attains 80 years, 1 in 100 reaches 70 years.—*Louisville Med. News.*

JOHNSTON ADJUSTABLE FOUNTAIN SPITTOON.



The defects of the Fountain Spittoons hitherto made are, that it is almost impossible to keep them from leaking, and that they occupy a rigid position close to the left of the chair, and hence prevent the operator from working on that side.

These defects will not be found in this spittoon, which is commended to the favor of Dentists by the following points of merit :

1st. It is readily adjustable to the position of the chair ; that is, it can by an easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches away from the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way.

3d. Having no wooden case, twelve inches square, but in its stead only an ornamented metal tube less than one and a half inches in diameter, it will not warp, and it occupies very little room.

4th. Its movable joints are so arranged that any leakage, if it should occur, is caught and conveyed into the waste pipes.

5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

6th. All its bright parts are of gun metal, and its tubing silk covered.

Price	\$60 00
Boxing	2.00

JOHNSTON BROTHERS, 812 Broadway, N. Y.

CATALOGUE OF Instruments for Dental Engines.

Each Bur will fit either the Morrison, Suspension or White Engine.

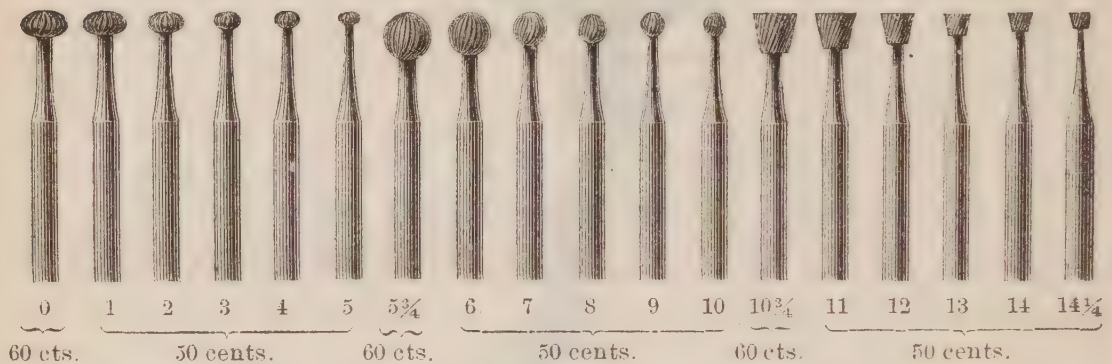
Patented September 10, 1872, February 24, 1874.

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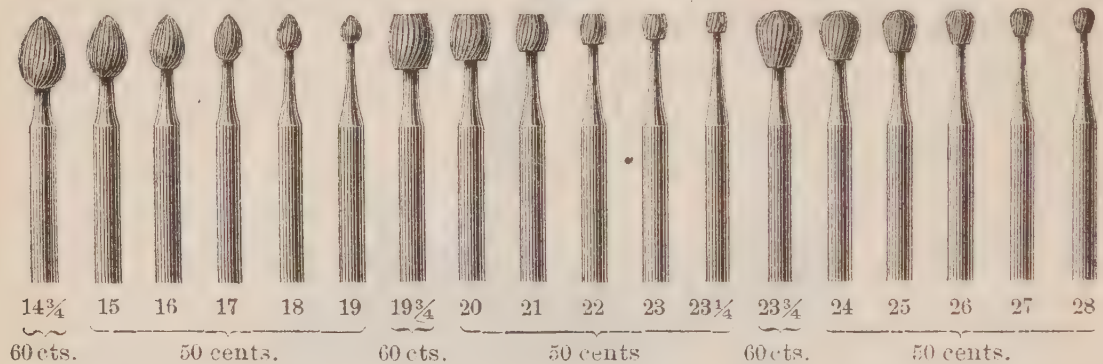
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Bud Shape.

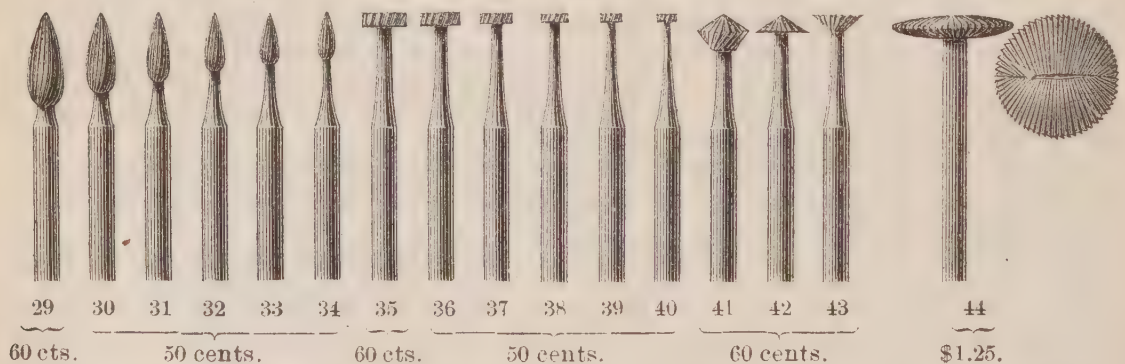
Barrel Shape.

Pear Shape.



Flame Shape.

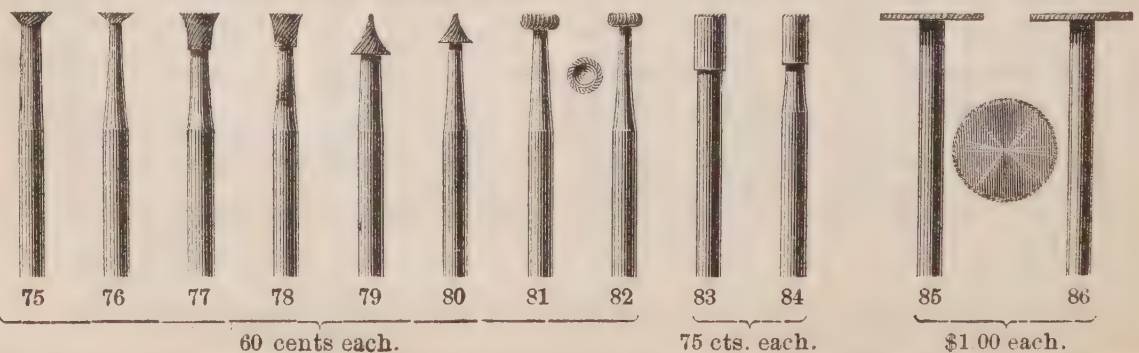
Wheel Shape.



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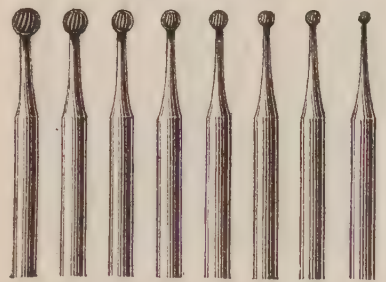
Trephines.

Plate Saws.



CAVITY INSTRUMENTS.

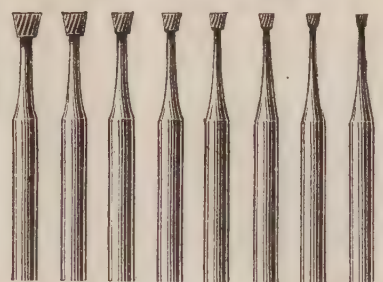
Round.



100 101 102 103 104 105 106 106½

25 cents each.

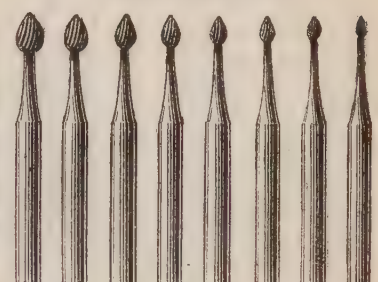
Inverted Cone.



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25 cents each.

Bud Shaped.

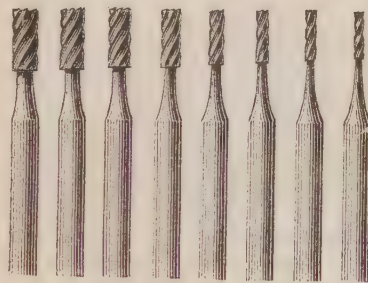


114 115 115½ 116 117 118 118¾

25 cents each.

For extra large sizes of these forms see below, Nos. 154 to 177.

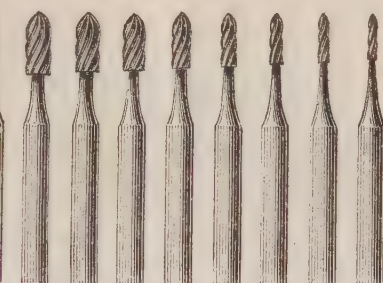
Square Fissure.



119 120 120½ 121 121½ 122 123 124

25 cents each.

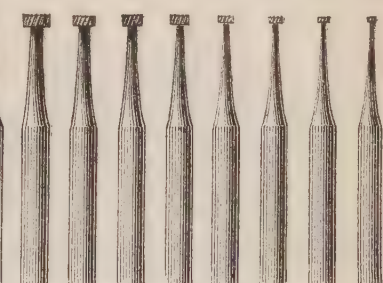
Pointed Fissure.



125 126 126½ 127 128 129 130 130½

25 cents each.

Wheel.

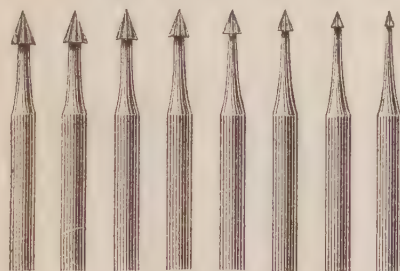


131 132 133 134 135 136 137 137½

25 cents each.

For extra large sizes of these forms see below, Nos. 154 to 177.

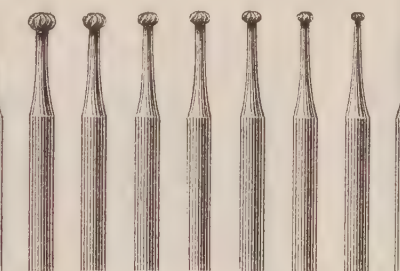
Cone Shaped.



138 139 140 141 142 143 144 145

25 cents each.

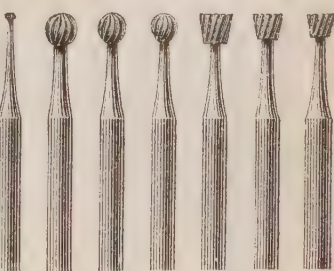
Oval.



146 147 148 149 150 151 152 153

25 cents each.

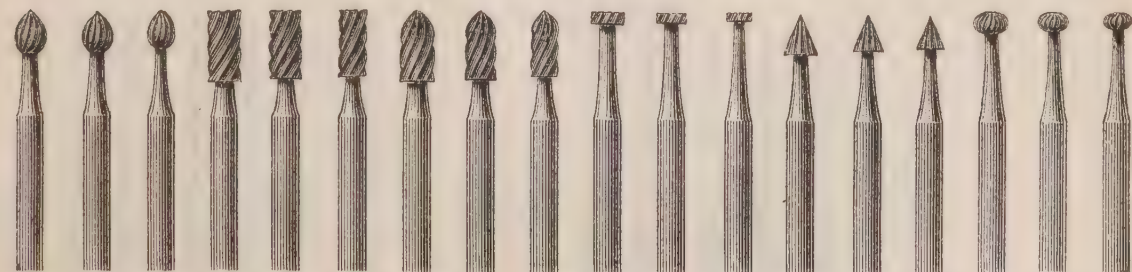
Extra Sizes.



154 155 156 157 158 159

35 cents each.

Extra Sizes of Various Shapes.

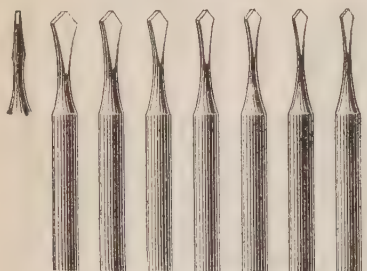


160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177

35 cents each.

CAVITY INSTRUMENTS.

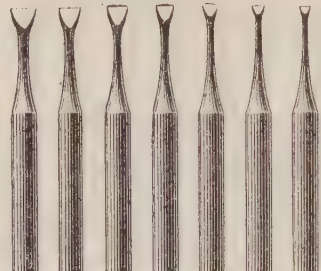
Spear Shaped Drills.



200 201 202 203 204 205 206

25 cents each.

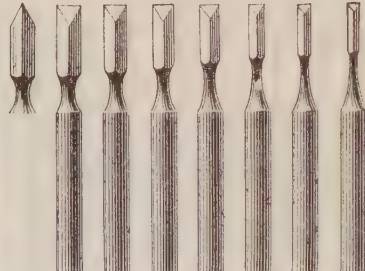
Spade Drills.



207 208 209 210 211 212 213

25 cents each.

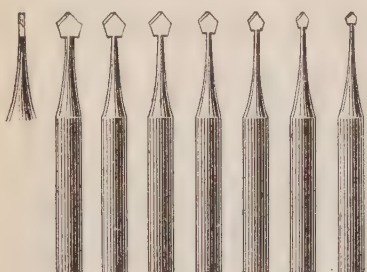
Square Drills.



213 1/2 214 214 1/2 215 216 217 218

25 cents each.

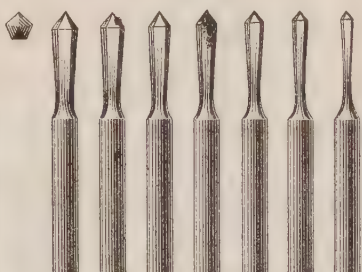
Forbes' Drills.



260 261 262 263 264 265 266

25 cents each.

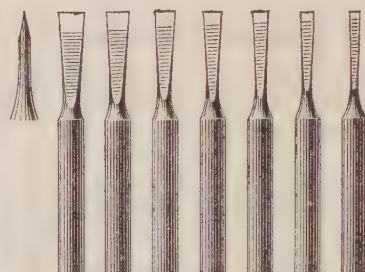
Five Sided Drills.



267 268 269 270 271 272 273

25 cents each.

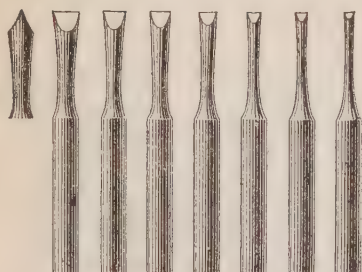
Flat Drills.



274 275 276 277 278 279 280

25 cents each.

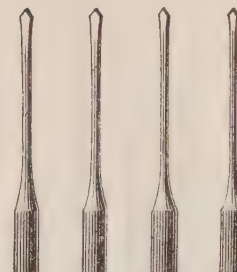
Round Drills.



281 282 283 284 285 286 287

25 cents each.

Drills for Mack's Screws.



288 289 290 291

40 cents each.

No 291 is for Gold Screw No. 1

" 290 " " " " 2

" 289 " " " " 3

" 288 " Pivoting Screws.

NERVE INSTRUMENTS.

Twist Drills.

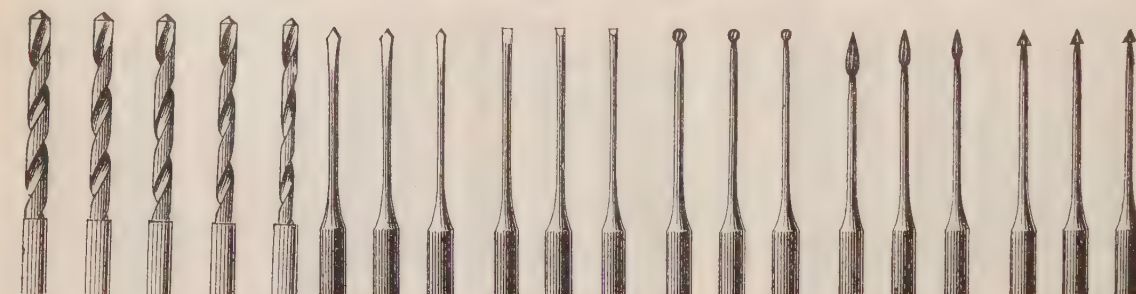
Spear Point Drills

Round Drills

Round Burs.

Flame Shape Burs.

Cone Burs.

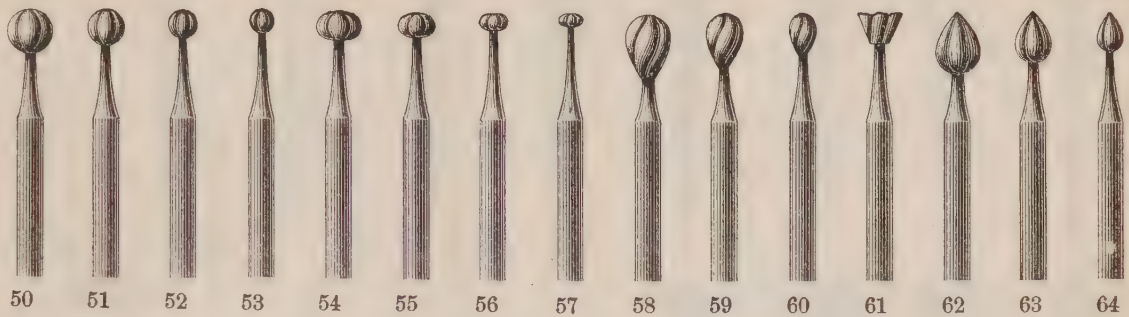


219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238

40 cents each.

Miscellaneous Finishing Instruments.

Burnishers.



75 cents each.

Same sizes, not corrugated, 50 cents each.

Screw Mandrel, without Collar.



No. 65.

13 cents.

Plain Chuck for Wood Points.



No. 69.

Plated, 35 cents each.

Plain, 25 " "

Screw Mandrel.



No. 66.

25 cents each.

Port Polisher.



No. 67.

Screw Socket, Nickel Plated, 35 cents each.



Parting Nut Mandrel.

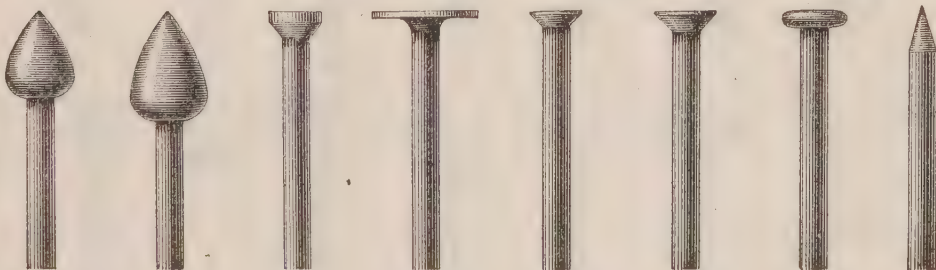


No. 68.

Nickel Plated, 40 cents each.

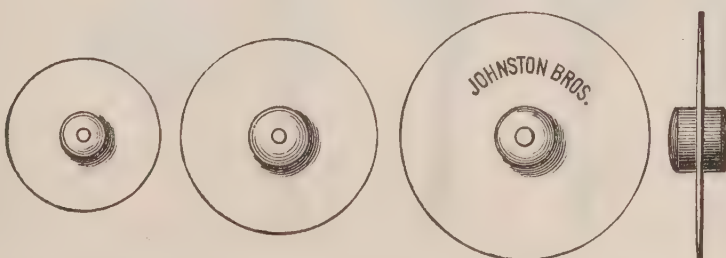
Plain, 30 " "

Wood Polishing Points.



Per Box of 100, assorted, \$1.25.

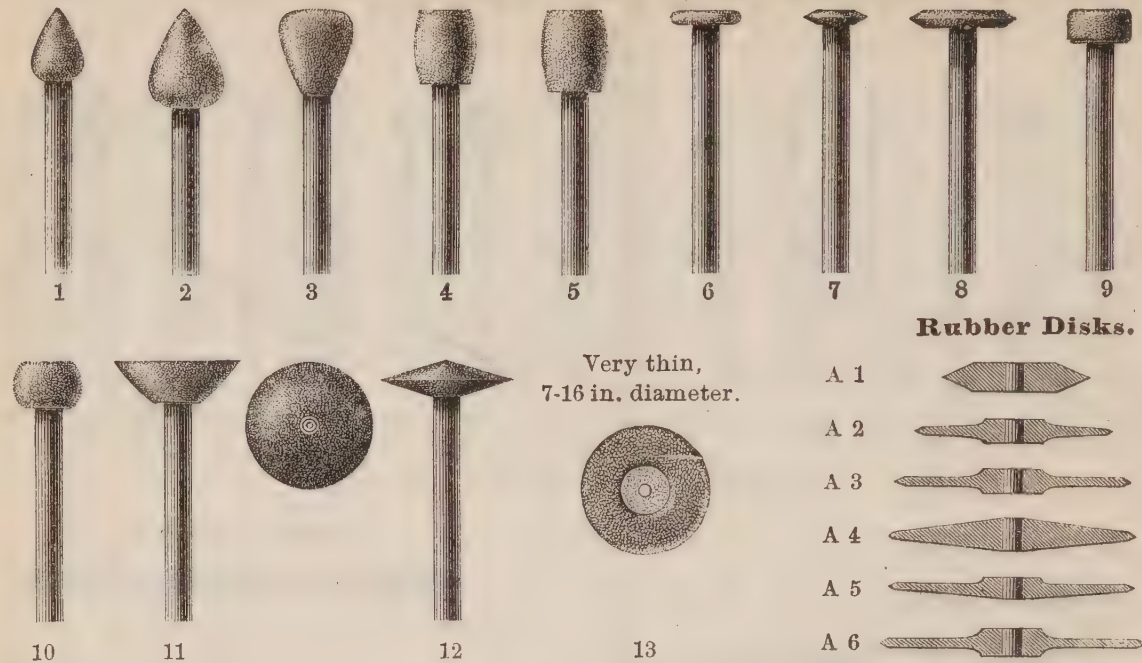
Boxwood Disks.



Price, per dozen, \$1.00.

CORUNDUM POINTS.

Forms by Dr. A. L. Northrop.



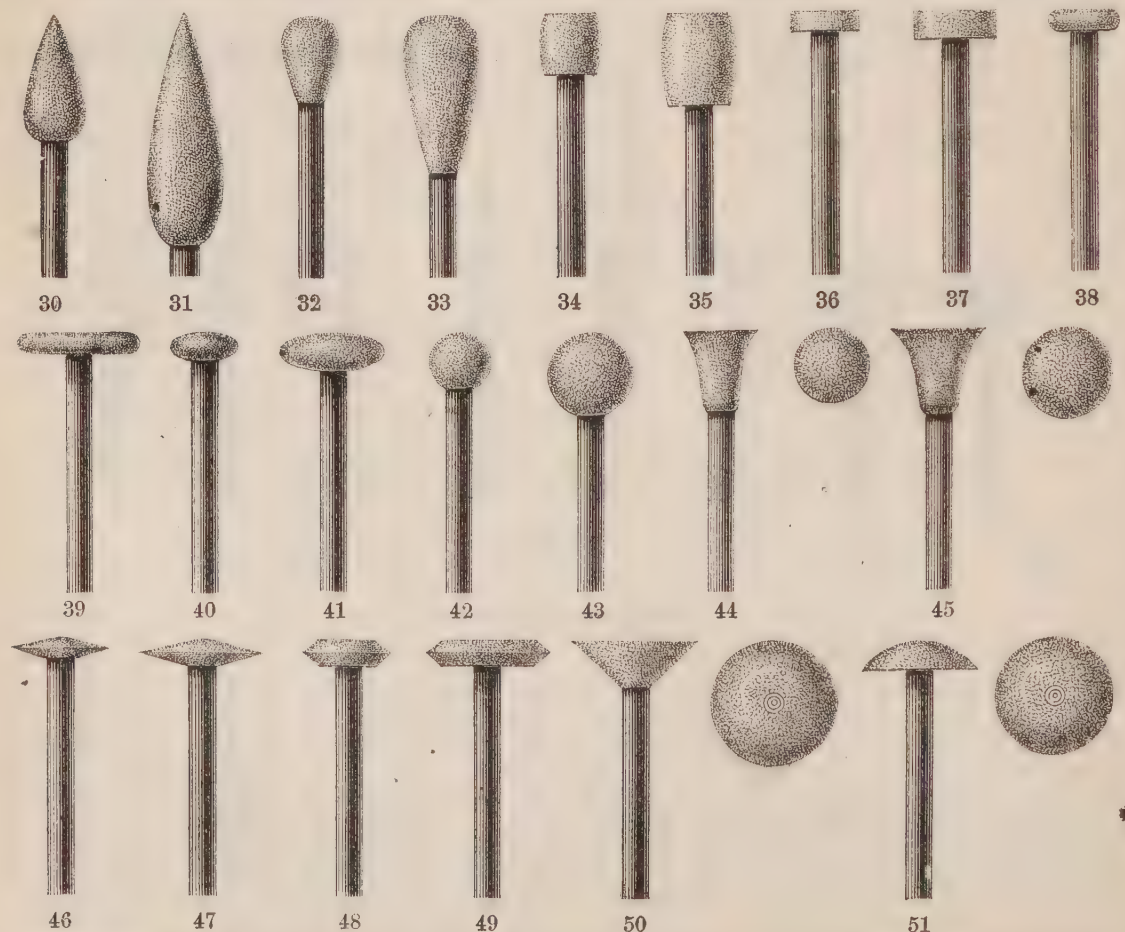
Mounted, per set.....\$1 50
 Mounted, per dozen.....1 50
 Not Mounted, per set.....75
 Not Mounted, per dozen.....75

Wheels as in cut No. 13, per dozen.....\$1 50
 Or Mounted, per dozen.....2 75
 Rubber Disks, Hard, per dozen }
 Rubber Disks, Soft, per dozen }1 20

Soft Rubber Points, Shapes of Corundum Points, per dozen.....75 cents.

ARKANSAS AND HINDOSTAN STONE.

These are kept in stock, mounted on Mandrels, of the forms represented below. Scotch Stones will be made to order of any of the same forms, but this Stone is so soft, that we do not deem them desirable except for such shapes as are without sharp angles.



Arkansas Stones, \$1.00 each. Hindostan Stones, 50 cents each. Scotch Stones, 30 cents each.

STONED BURS.

The teeth of these Burs are laid out with great accuracy, and then filed to *exactly equal length*, but are not brought to a cutting edge. The Bur is next tempered, and each tooth *afterward* stoned to a fine edge. This secures a Bur perfect in all its cutting edges, and unequaled by anything of the Bur kind. Those who have used these most, rarely buy any other kind, and assure us that they find true economy, as well as great satisfaction in their use.

We invite the fullest examination of all of our Engine Instruments, as regards

The quality of the steel from which they are made.

The shape and finish of the cutting edge.

Their temper.

The rapidity with which they cut.

Their durability.

The shaft of each instrument is *round and highly finished*, and can therefore be used without unreasonable and unnecessary injury to the nose of the hand-piece, which injury occasions unsteadiness in all the uses of the Engine.

They will *bear examination in quality and price.*

MINIM BURS.

It is impossible to accurately represent by cuts the smallest sizes of Burs that we make. We offer Cavity Burs, either Round, Inverted Cone, Bud-Shaped, Wheel, Cone-Shaped or Oval, of smaller sizes than are represented or numbered herein. Although more than ordinarily expensive to make, **we keep the price the same as for ordinary Cavity Burs.** In sending orders, please specify the shape desired, as for example: "ONE DOZEN ROUND MINIM BURS."

SPECIAL OFFER.

A discount from list prices of ten (10) per cent. will be given on all cash orders for Engine Instruments which amount to twenty-five dollars or upwards.

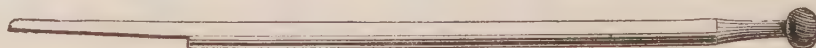
PRICES OF ENGINE EQUIPMENTS.

Plug Finishing Burs.....	\$6 00	per doz.	50 cts. each
Extra Size Finishing Burs.....	7 20	"	60 "
Stoned Finishing Burs.....	12 00	"	1 00 "
Extra Sizes proportional prices.			
Excavating or Cavity Burs.....	3 00	"	25 "
Extra Sizes.....	4 20	"	35 "
Stoned Excavating or Cavity Burs.....	6 00	"	50 "
Stoned Excavating or Cavity Burs, Extra Sizes proportional prices.			
Minim or very Small Burs, Round, Bud, Wheel,			
or Cone shaped.....	3 00	"	25 "
Right Angle Cavity Burs and Drills.....	3 00	"	25 "
Trephines.....			75 "
Screw Mandrels, with Collar.....	3 00	"	25 "
Screw Mandrels, blanks (no collar), for Mounting Wooden Wheels, Leathers, &c.....	1 50	"	13 "
Large Knife Edge Wheel Burs.....			1 25 "
Plate Saws.....			1 00 "
Burnishers, Corrugated.....	9 00	"	75 "
Burnishers, Smooth.....	6 00	"	50 "
Parting Nut Mandrels, Nickel Plated.....	4 80	"	40 "
Parting Nut Mandrels, plain.....	3 60	"	30 "
Drills of all forms and sizes (except Nerve Drills).....	3 00	"	25 "
Nerve Instruments.....	4 80	"	40 "
Leathers, Mounted.....	3 00	"	25 "
Leathers, not Mounted.....	1 00	"	10 "
Bands for Engine, Morrison.....	1 20	"	10 "
Bands for Engine, Suspension.....	1 80	"	15 "
Ive's Tongue and Cheek Protectors (2 sizes), to be used with disks, wheels, &c..... per set.	1 50		75 "
Right Angle Attachments.....			5 00 "
Arkansas Stones, Mounted.....	12 00	"	1 00 "
Hindustan ".....	6 00	"	50 "
Scotch ".....	3 60	"	30 "
Corundum Points, Mounted.....	1 50	"	13 "
Corundum Points, not Mounted.....	75	"	7 "
Rubber Disks, hard or soft.....	1 20	"	
Twist Drills.....	4 80	"	40 "
Boxwood Disks (3 sizes, see cut).....	1 00	"	10 "
Wood Socket or Port Polisher, plain.....			25 "
Wood Socket or Port Polisher plated.....			35 "
Wood Socket or Port Polisher, Screw Socket.....			35 "
Corundum Wheel, No. 13, $\frac{7}{16}$ in. diameter.....	1 50	per doz.	13 "
Soft Rubber Points, shape of Corundum Points.....			75 cts. per doz.
Wood Polishing Points.....			\$1 25 per Box.

We are prepared to furnish any of the instruments illustrated in this pamphlet, adapted to either the A, B, or C style Hand Piece. The C style Instrument also fits the S. S. White Engine.

In ordering instruments, designate them by the numbers, and state whether they are wanted to fit the (A,) (B,) or (C) hand-piece. Each bur is numbered on its shank.

Style A.



Style B.



Patented Sept. 10, 1872.

Style C.



Patented Feb. 24, 1874.

NOTE.—To fasten Burs in the Hand Piece, it is well to push back the catch-spring with the left hand while inserting the Bur with the right hand.

Instrument Stands for Engine Tools.

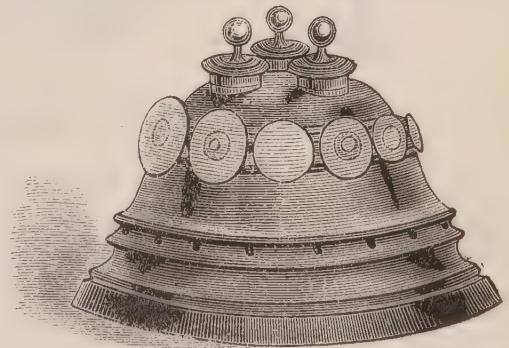


No. 1 as above. **No. 2** with many more, but smaller holes.

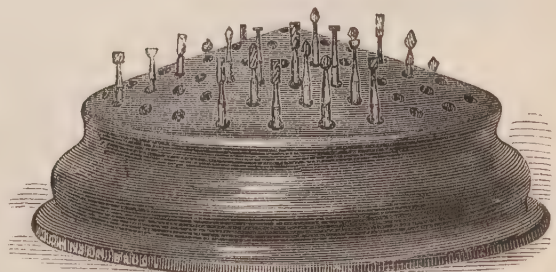
This is made of rosewood and maple in alternate layers, and is very ornamental. Besides the form shown above, we have another like this in all respects, except that the holes into which the burs are placed are made so small as to hold only one or two instruments each. We call this No. 2.



No. 4.



No. 5.



No. 3.

The cuts above show at a glance the advantages offered by these new styles of stands. The conical shape of the top of the bur stand renders it much easier to select and to remove any particular instrument desired than is possible when the top of the stand is flat, because in the first named case each bur is brought distinctly into view.

No. 5, for keeping mounted disks, has been long needed, both on the score of economy and convenience. It is provided at its apex with three stoppered receptacles for polishing *pastes*, each having a brush with which to convey the paste to the buff or wheel with which it is used.

Instrument stands Nos. 1 and 2, are made of alternate layers of rosewood and maple, highly polished, and are hence more expensive than the later styles, which are of black walnut. They are especially adapted for the A and B style burs, but also answer perfectly with C burs.

PRICES.

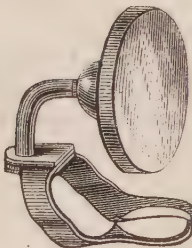
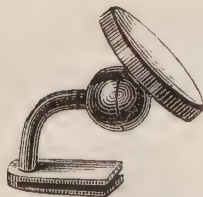
Nos. 1 or 2, complete, each.....	\$2 00
Or without glass cover.....	1 50
No. 3.....	1 00
No. 4.....	1 50
No. 5, having three cups for paste	2 00

SPECIAL NOTICE.

We have on hand a small stock of REMODELED MORRISON DENTAL ENGINES, in every respect first quality and new. Having determined to discontinue manufacturing this style of Engine, we offer the present lot, (until further notice) at Thirty Dollars each, net cash. Right Angle, Five Dollars ; boxing, Two Dollars.

REFLECTORS.

[OSBORN'S.]



PATENTED FEB. 16th, 1875.

This reflector is designed to concentrate a strong light upon the cavity. It is so constructed that it can be readily attached to any rubber dam clamp, and by means of a ball joint the mirror can be adjusted to throw light upon any point in the mouth. The operator will readily perceive the great advantage to be derived from this invention in operations upon posterior cavities in molars. The mirror being held in position by the clamp (as shown in one of the cuts), the hands of the operator are entirely free. It is thought that two sizes will meet all requirements.

PRICES.

No. 1, diameter 1/2 in.....	\$2 75
No. 2, " 5/8 in.....	2 75
Set.....	\$5 50

JOHNSTON BROTHERS,

812 Broadway, N. Y.

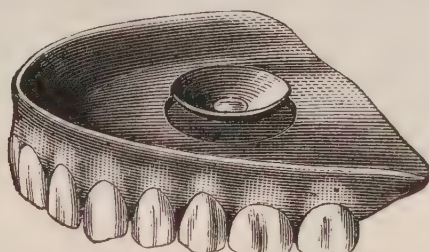
\$25 Worth of Engine Instruments,

TEN PER CENT. DISCOUNT.

1st. We repeat our notice of a special discount on all orders with cash, for Engine Burs, plain or stoned, Burnishers, Disks, Corundum, Arkansas and Hindostan Stones, etc., when amounting to twenty-five dollars or more. These are our "Universal" Instruments, and will fit either the Morrison, Suspension or S. S. White Engine. Order the Instruments by number, stating whether the numbers are from our Bur List or are those of another maker. All these Instruments are of the best quality, both in material and workmanship.

2d. All orders of less amount **accompanied with cash**, sent us for Instruments for Dental Engines, will be sent free of cost to the purchaser, by mail, if he so directs.

NEW PATENT ATMOSPHERIC DISK.



FOR HOLDING ARTIFICIAL TEETH FIRMLY IN PLACE

In Eating, Talking, Laughing, Singing, Coughing or Sneezing.

The undersigned offers to the dental profession this new and valuable device for retaining base plates securely in the mouth. Its utility has been demonstrated in over five hundred cases in my own practice. I believe it must come into general use, as no patient will dispense with it after a trial of its advantages. The Patent bears date of January 24, 1871, with seventeen years to run. Office, Town, County, or State rights for sale. Those desiring to test the disks practically before purchasing, can secure the necessary materials, ready for use, for six cases, with full instructions, by sending P. O. Money Order for three dollars.

Office rights for the full term.....	\$40 00
“ “ “ one year	10 00

Those purchasing rights for one year will be given rights for the balance of the term for \$30 more, if they choose to continue after the year has expired.

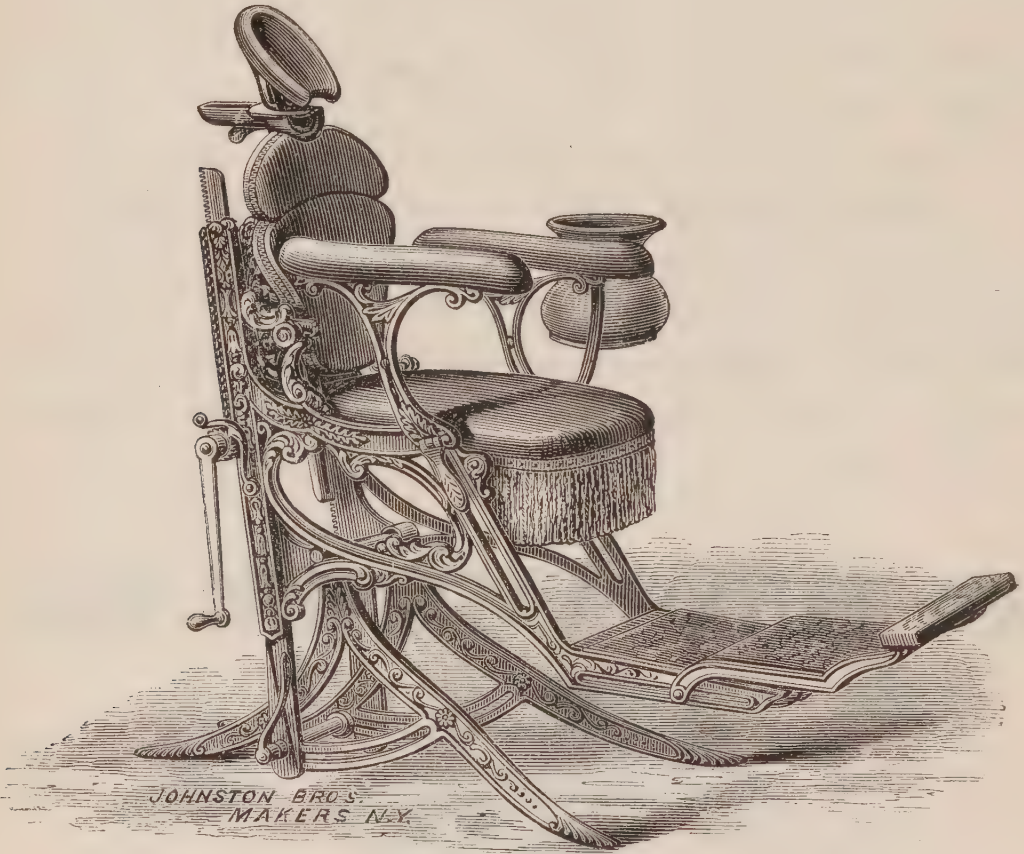
N. B. The Relyea Retainer and all other styles of disks are infringements of our patent; we shall certainly protect our rights.

Address

DR. QUINCY A. SCOTT,

Lock Box 1,015, Pittsburgh, Pa.

THE MORRISON DENTAL CHAIR.



**Price \$150.00, or, with Castors, \$160.00. Boxing, \$5.00.
Spittoon Attachment, \$8.00.
WITH JOHNSTON'S NEW HEAD-REST, \$8.00 EXTRA.**

It possesses great superiority over any chair before offered to the profession, and is at the same time less expensive than any other first-class chair. Some of its points of superiority we here enumerate :

- 1st. All the advantages of any low-based chair, and also of any high-based chair, are here secured in a single chair. In it the patient can be placed lower than in the lowest-based chair made, or higher than in any other of which we have knowledge. At its lowest position the seat is fifteen inches, and at its highest position forty-two inches above the floor.
- 2d. The operator using the Morrison Chair can either stand or sit at his work, as he may choose, working with equal convenience in either position.
- 3d. It has been a very general complaint that dental chairs are too wide at the back, so holding the operator away from his work. Here this difficulty is overcome. The chair is narrow at the back, so that the operator need not stretch to reach the patient, but *can lower either arm of the chair out of the way* and so be as near the patient as he may choose.
- 4th. It can be changed from its lowest to its highest position in seven seconds – a celerity impossible in any chair raised by a screw.

- 5th. It can be very readily and perfectly adapted to operations on children of any age
First. Because in it the child can be raised as high as needed for the tallest operator.
Second. It provides a comfortable back and head rest, exactly as for grown persons.
Third. The footstool can be lengthened or shortened, to suit children of any size.
- 6th. The back of the chair can be lengthened or shortened rapidly and at will.
 7th. The lower part of the back can be thrown forward to support the small of the patient's back.
 8th. The chair, when adjusted to any position, is firm or steady wherever placed, and this is *especially true of the head-rest*.
 9th. It occupies less room than any other operating chair.
 10th. Although the footstool, when at its extreme length, is much longer than any other made, yet a person of ordinary weight can stand on its extremity without tipping the chair.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

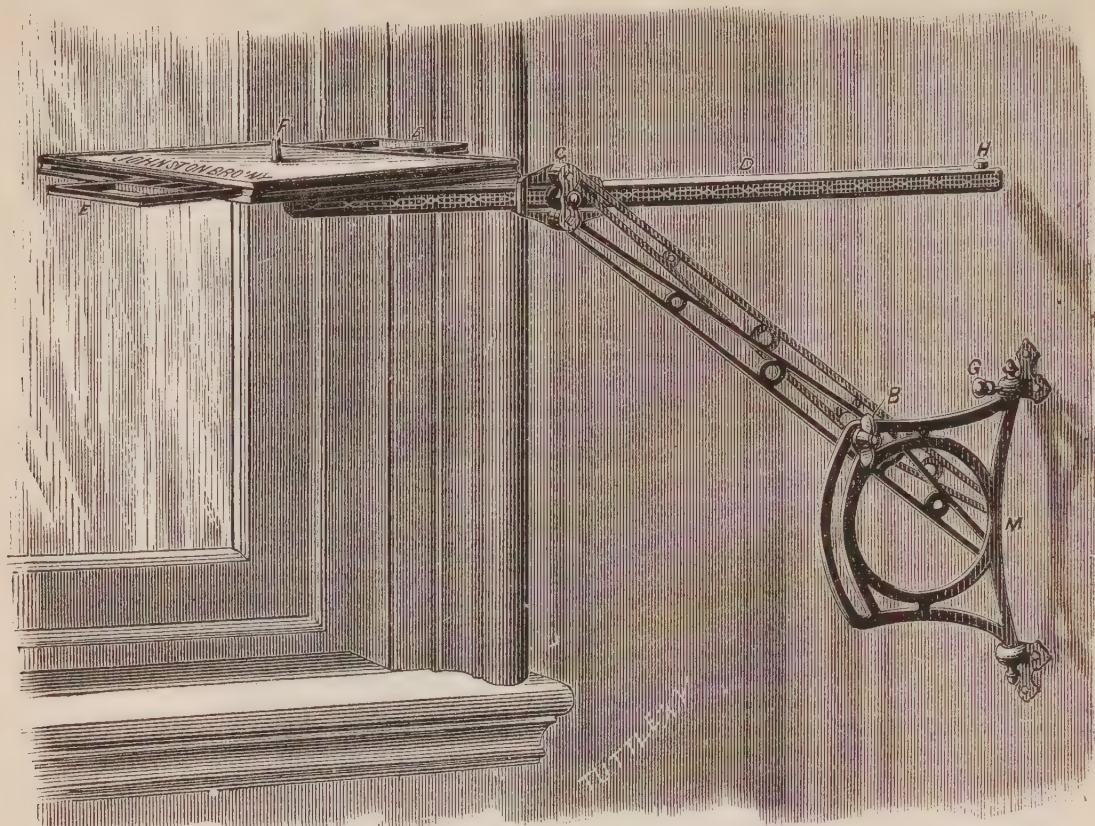
We venture to append the names of some of those who have used the Morrison Chair. As the list of purchasers is too long for publication here, we name a few only from each section of the country.

O. A. JARVIS, *New York*.
 D. H. GOODWILLIE, *New York*.
 O. A. HOUGHTON, *Brooklyn, N. Y.*
 A. C. HAWES, *New York*.
 W. B. CHAMBERS, *Newark, O.*
 C. B. ANSART, *Oil City, Pa.*
 M. H. WEBB, *Lancaster, Pa.*
 T. W. FRENCH, *Gt. Barrington, Mass.*
 E. H. EVANS, *Rockland, Me.*
 E. O. SMITH, *Salem, Oregon*.
 W. F. LEWIS, *Winona, Minn.*
 T. J. McMILLAIN, *Paris, Ky.*
 G. W. TINDALL, *Kansas City, Mo.*
 A. W. KINGSLEY, *Elizabeth, N. J.*
 J. N. SCRANTON, *Bennington, Vt.*
 O. A. GLIDDEN, *New York*.

JAMES McMANUS, *Hartford, Conn.*
 R. F. BORDEN, *Red Bank, N. J.*
 F. A. SHAILER, *Essex, Conn.*
 WILLIAM DUTCH, *San Francisco, Cal.*
 R. B. DONALDSON, *Washington, D. C.*
 B. F. COY, *Baltimore, Md.*
 C. P. CLIFFORD, *Lowell, Mass.*
 S. H. HINKEL, *Stannton, Va.*
 E. G. WHEELER, *Mobile, Ala.*
 J. A. DAVIS, *Chicago, Ill.*
 C. B. ERICHSON, *New Britain, Conn.*
 H. BENTLEY, *West Meriden, Conn.*
 H. H. SAYLES, *Elmira, N. Y.*
 PRESTON DAY, *Warren, R. I.*
 E. T. DARBY, *Philadelphia, Pa.*
 G. W. TRIPP, *Auburn, N. Y.*

H. B. SANDS, M.D., Surgeon, *New York*

MORRISON DENTAL BRACKET



PRICES.

With Black Walnut Table, 12 inches square.....	\$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather.....	40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket.....	17.00.
Boxing.....	\$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

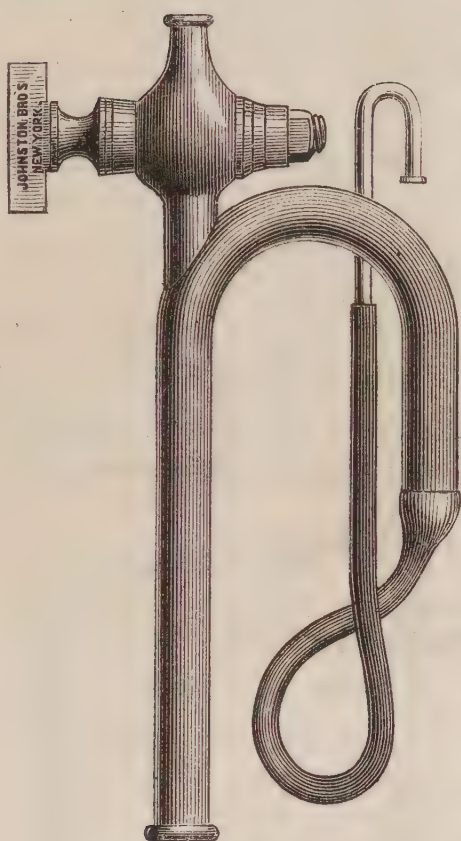
- 1st. It combines a greater variety of range and movement than any other.
- 2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
- 3d. It provides a clean receptacle for foil and instruments.
- 4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
- 5th. Its drawers extend through the table and can be opened from either side.
- 6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

ELLIOTT'S SALIVA EJECTOR.



PRICE \$5.00.

The accompanying cut, half-size, fairly represents this simple and effective apparatus for freeing the mouth from saliva. It can be used wherever there is a supply of running water. It may be described as a nickel-plated metallic syphon, having a stop-cock so let into the upper part of its long arm—that if the stop-cock is attached to a pipe conveying running water, the water will flow directly through that arm, and be discharged at its lower end, thereby causing “suction” through its short arm and its connections. This short arm is connected by means of a light rubber tube with a glass mouth-piece designed to be placed in the mouth of the patient and receive the saliva. The “suction” is so strong where there is even a moderate head of water, that if the mouth-piece is

placed in a tumbler of water, the tumbler will be completely emptied in a moment.

Three pieces of rubber tube are required with it as ordinarily used.

1st. A short piece between the supply pipe and the stop-cock. This is sent with the Ejector.

2nd. A waste pipe from the bottom of the long arm to wherever it is desired to discharge the water.

If the Ejector is to be attached to one of the faucets of an ordinary wash-basin, the waste-pipe may be very short, or dispensed with altogether. Price 25 cents per foot.

3d. From the short arm to the dental chair, this tube, as furnished with the Ejector, is four feet long. If a longer tube is needed it can be supplied at 20 cents per foot, on order.

JOHNSTON BROS.,

812 Broadway, New York.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or “chattering” which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

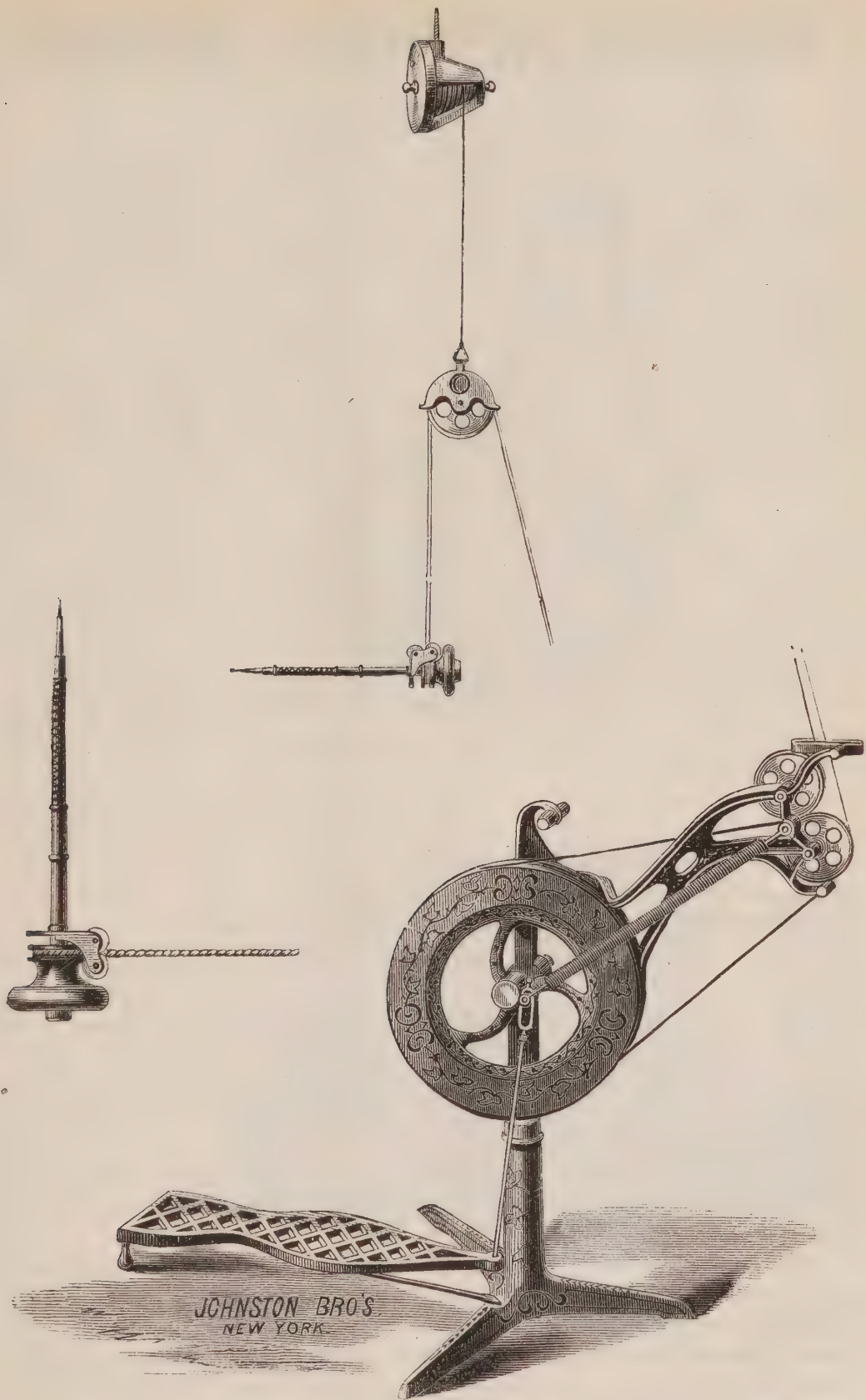
4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a “*light running*” Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROTHERS, 812 Broadway, N. Y



SUSPENSION DENTAL ENGINE.

(DR. ELLIOTT'S INVENTION.)

Price, \$50.00. Right Angle Attachment, \$5.00. Boxing, \$1.00.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($\text{NO}^2 + 2\text{O} = \text{NO}^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid Nitrous Oxide*, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether.....	I	death to 23,204 administrations.
Chloroform.....	I	" 2,723 "
Mixed Chloroform and Ether....	I	" 5,588 "
Bi-chloride of Methylene.....	I	" 7,000 "
NITROUS OXIDE		no Deaths in 75,000 . "

Edward R. Squibb, M.D., than whom our country has no more able pharmacist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

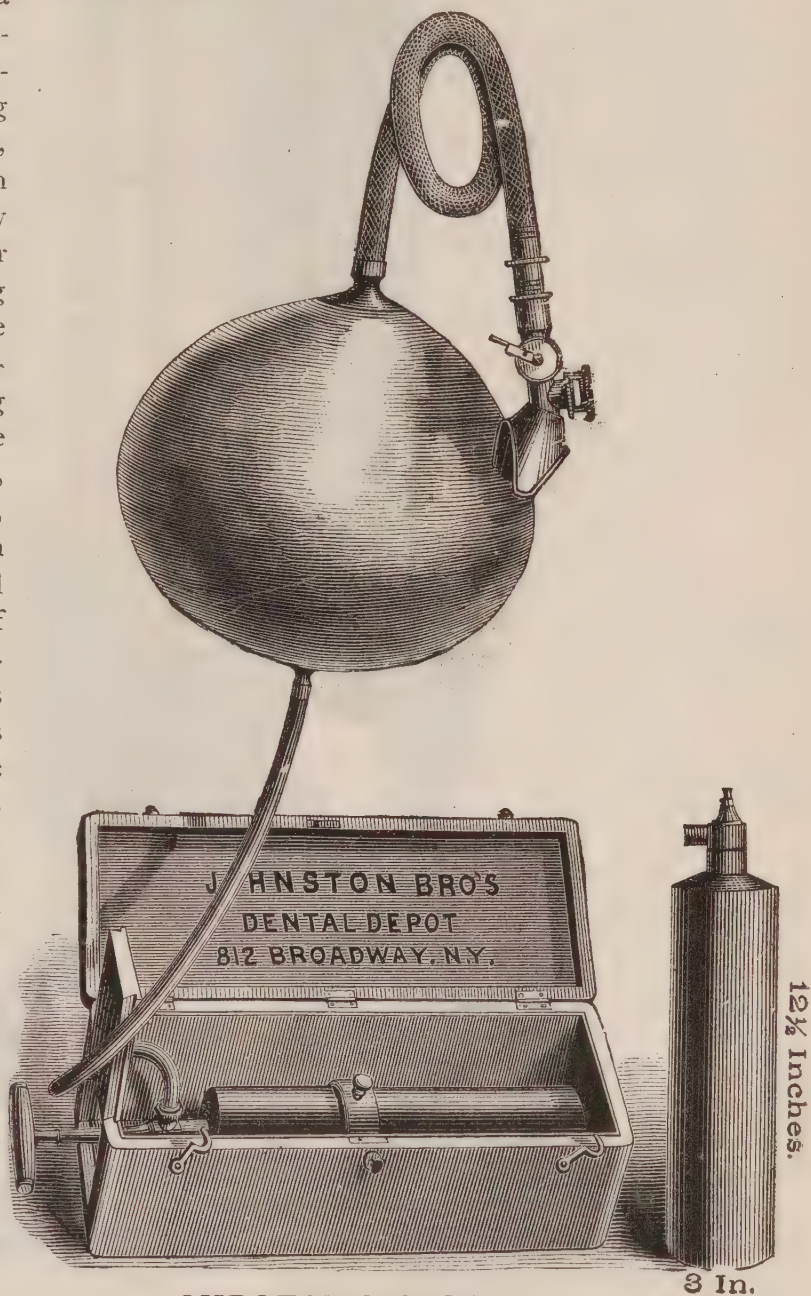
When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

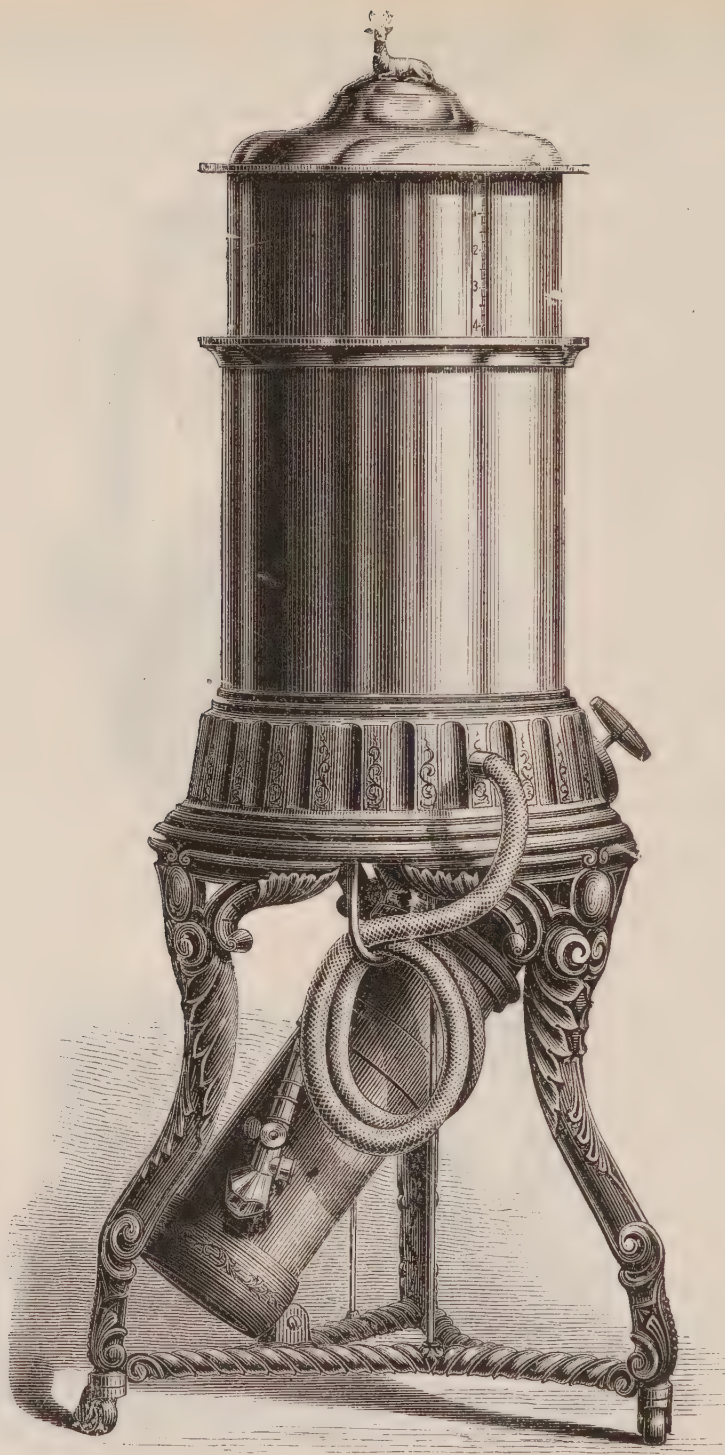
Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers



SURGEON'S CASE.

without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



NICKEL-PLATED GASOMETER
AND ORNAMENTED STAND
FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas—this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality*.

JOHNSTON BROS., 812 Broadway, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler **No. 1** . . . \$42 00

Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic

Inhaler **No. 2** . . . 45 00

Boxing either, \$1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas 16 00

Refilling Cylinder 6 00

Nickel-Plated Gasometer, with ornamented iron stand 128 00

Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered

Tubing) 12 00

1000 Gallon Cylinder 36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of 4½ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at 4½ cents 45 00

Morocco covered case, with ring and thumb screw, velvet lined 12 00

Polished bl'k walnut “ “ “ “ “ “ 13 00

Or these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity) 5 00

Rubber Bag, with covered inhaler tubing, extra size 7 00

Inhaler, latest style, with two way stop cock, adapted to the use of both dentists

and surgeons, with connection 9 50

Key, Nickel Plated 1 50

Wrench, “ 50

Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag 1 50

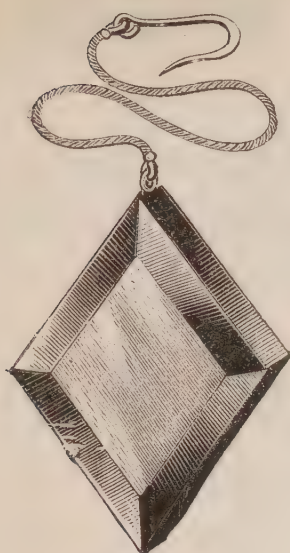
Covered Inhaler Tubing, per foot 50

Plated Connection to fit old style Inhaler 1 00

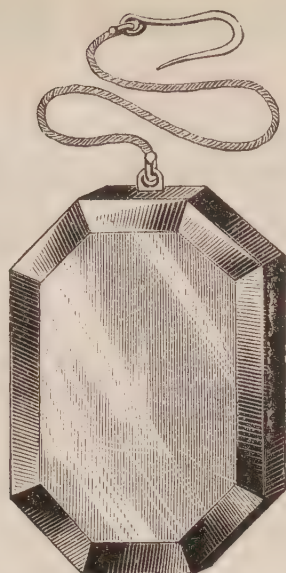
JOHNSTON BROS.,

812 Broadway, N. Y.

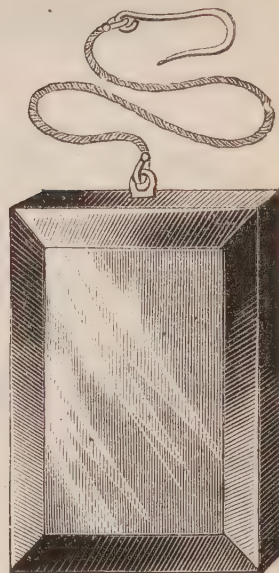
RUBBER DAM WEIGHTS.



No. 1.—1¼ Oz.



No. 2.—2¼ Oz.



No. 3.—2½ Oz.

These are made of metal, and are nickel plated. They are a decided convenience to one using rubber dam—as by attaching them to the free edges of the rubber, these edges are kept out of the way of the operator and from annoying the patient.

Price, single.....40 cents ; per set, \$1.00.

JOHNSTON BROS.,
812 Broadway, N. Y.

RUBBER DAM.

Invention of Dr. S. C. BARNUM.

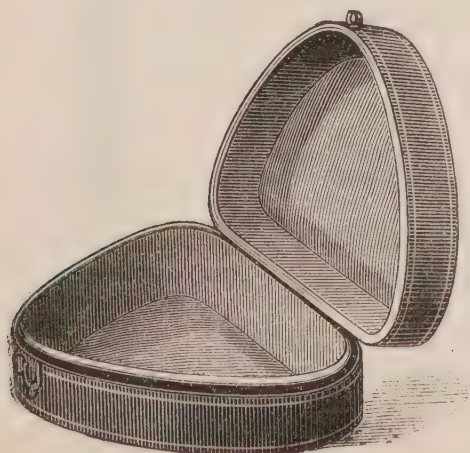
We constantly keep in stock an excellent quality of this article, now a necessity in Dental practice. This we offer in large or small quantity.

PRICES:—Thin, per yard.....\$2.50.
Medium, per yard..... 3.00.
Thick, “ “ 3.50.

A liberal discount to the trade.

JOHNSTON BROTHERS,
812 Broadway, N. Y.

TOOTH CASES.



Morocco, half oval, lined with cotton velvet, each.....\$ 35
Morocco, half oval, lined with cotton velvet, per dozen..... 3 60
Morocco, half oval, brass hinges and silk lined top, each..... 60
Morocco, half oval, brass hinges and silk lined top, each per dozen... 6 00

JOHNSTON BROS.,
812 Broadway, N. Y.

"Premium" Gutta Percha Stopping.

It will not be disputed that a filling which offers the following properties, is sure of a hearty welcome by both dentist and patient.

"Premium" Gutta Percha Stopping,

1st.—Is thoroughly plastic, but not sticky; in this respect an improvement on previously offered Gutta Percha.

2d.—It is very nearly the color of the tooth.

3d.—It adheres tenaciously to the walls of the cavity, and so protects the tooth from decay. Osteoplastic fillings frequently fail, by disintegration around the margins of the cavity, and admit moisture to the seat of previous decay.

4th.—It does not work "salvy," and by sticking to the *warmed*, (but not *hot*,) instrument by which it is applied, drag itself from the position in which it has just been placed—a common fault with Gutta Percha hitherto.

5th.—It is non-escharotic, and so may be used directly over an exposed nerve, which cannot be safely done with the most used "soft fillings."

6th.—It is a non-conductor of heat, and hence will not transmit thermal changes, from a cold draft of air, or from hot or cold food to the under-lying nerve. In this it is superior to the best metallic fillings.

7th.—It is readily removable by proper instruments, when used as a temporary filling, more readily than either amalgams or cements.

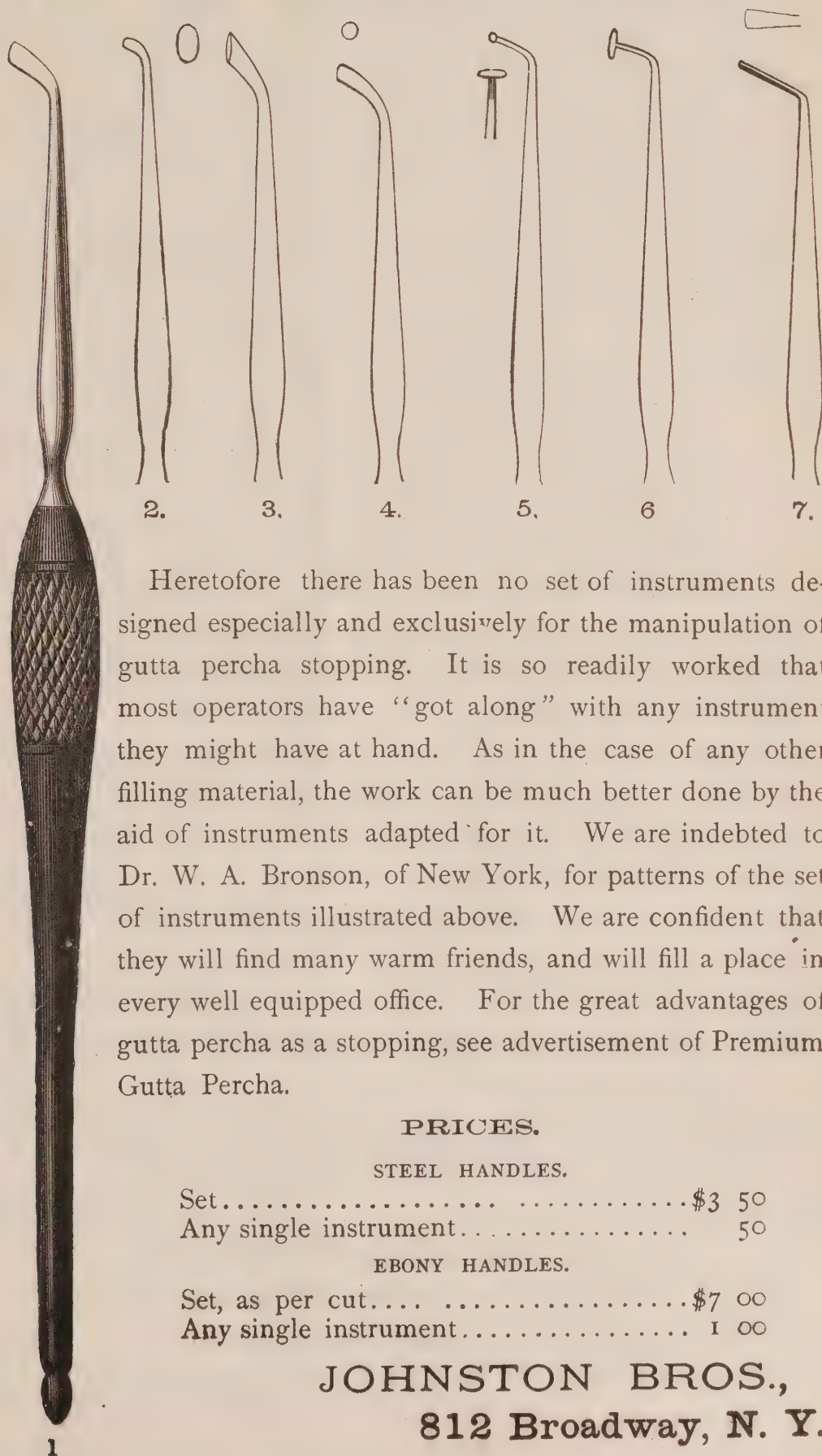
8th.—It can be used in cavities having frail walls, or where the tooth is sensitive, since very little force is required for packing it.

9th.—It hardens promptly.

Although used ordinarily as a temporary filling, instances are numerous where a Gutta Percha filling has lasted ten or twelve years. We think a variety can be made which will have sufficient hardness to make it fit for permanent fillings.

Price, per ounce	\$5.00
" " $\frac{1}{2}$ ounce	2.50
" " pennyweight	25

DR. W. A. BRONSON'S GUTTA PERCHA INSTRUMENTS.



Heretofore there has been no set of instruments designed especially and exclusively for the manipulation of gutta percha stopping. It is so readily worked that most operators have "got along" with any instrument they might have at hand. As in the case of any other filling material, the work can be much better done by the aid of instruments adapted for it. We are indebted to Dr. W. A. Bronson, of New York, for patterns of the set of instruments illustrated above. We are confident that they will find many warm friends, and will fill a place in every well equipped office. For the great advantages of gutta percha as a stopping, see advertisement of Premium Gutta Percha.

PRICES.

STEEL HANDLES.

Set.....	\$3 50
Any single instrument.....	50

EBONY HANDLES.

Set, as per cut.....	\$7 00
Any single instrument.....	1 00

JOHNSTON BROS.,
812 Broadway, N. Y.

SMITH'S OXYCHLORIDE OF ZINC,

Put up in ounce packages, in MOROCCO CASES, neatly lined with velvet, containing

FIVE GLASS STOPPERED BOTTLES.

The Center Bottle LIQUID.

THE POWDER IN FOUR COLORS, IN 1-4 OZ. BOTTLES.

With these Colors any desired shade can be obtained.

Each Case Contains a DROP TUBE.

Price per Package, \$4.00.

The above is also put up as heretofore, in one oz. Glass Stoppered Bottles, with DROP TUBE. Price per package, \$1.00. Prepared by

DR. J. H. SMITH.

AT WHOLESALE OR RETAIL BY

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CHEMICALLY PURE TIN FOIL. NO. 1. 1000 Fine.

We are making an excellent quality of this foil, of numbers 4, 6, 8 and 10 (grains per sheet), and will make any higher numbers when ordered in lots of twenty books per number.

Price, per book.....75 cents.

JOHNSTON BROTHERS.

TIN FOIL. NO. 2.

A good article; about number 4.

Price, per book.....50 cents.

JOHNSTON BROTHERS.

SPUNK.

1 Ounce Package.....20 cents.

JOHNSTON BROTHERS.

CHEMICALLY PREPARED MERCURY.

$\frac{1}{4}$ lb. Bottles, each.....70 cents.

JOHNSTON BROTHERS.

TOWNSEND'S AMALGAM.

Ounce packages.....\$2.00

JOHNSTON BROTHERS.

DENTAL PLASTER.

Our experience leads us to believe this fully equal to any offered for dental purposes.

Barrels.....\$4.50

Half Barrels.....3.00

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C. P. KREIZER, M.D., Assistant to the Professor of Chemistry, Materia Medica and Therapeutics.

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Monday, October 4th, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions...	\$150.00
For the Course of Lectures only.....	100.00
Matriculation	5.00
Graduation Fees.....	30.00

Board may be obtained for from \$6 to \$8 per week.

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FRANK ABBOTT, M.D., Dean,

12 West Nineteenth Street, New York.

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Dental Department.

BOSTON, MASS. 1875-76.

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IRA A. SALMON, D.D.S., University Lecturer on Operative Dentistry.
CHARLES B. PORTER, M.D., Demonstrator of Practical Anatomy.
CHARLES WILSON, D.M.D., Demonstrator in Charge.
GEORGE F. GRANT, D.M.D., Demonstrator of Mechanical Dentistry.

The Ninth year of this School begins on the 28th of September and continues till the last Wednesday in June. The distinction of Summer and Winter sessions being hereafter abolished. It will be divided into two equal terms, with a recess of one week at Christmas. The course of instruction will be progressive, extending over two years, the lectures of one year not being repeated in the next.

The regular examinations will be held in the following order, viz.: At the end of the first year, anatomy, including dissection, physiology and general chemistry. A certificate from the demonstrator of anatomy will be required of each student, that he has satisfactorily dissected the three parts of the body.

At the end of the second year, dental pathology, including a knowledge of gestation and diseases of women so far as they affect the mouth and throat, dental materia medica and therapeutics, oral surgery and surgical pathology, operative and mechanical dentistry. The examinations in operative and mechanical dentistry will include actual operations and the preparation of specimens of mechanical dentistry.

Every candidate must be twenty-one years of age, and of good moral character; he must give evidence of having studied medicine or dentistry three full years; he must have spent at least one continuous year at this school, have presented a satisfactory thesis and have passed all the required examinations.

The University Degree, D.M.D. (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfil the requirements.

Students may be admitted to advanced standing upon passing a satisfactory examination in a majority of the studies already pursued by the class; but no student shall advance with his class or be admitted to advance standing until he has passed such examination.

The work in the operative and mechanical infirmaries will go on throughout the course, but no student shall be permitted to operate at the chair until he has by observation and practice on extracted teeth satisfied the Professor of his fitness.

The faculty recommend young men who propose to take the degree to spend the whole of the required term of three years of study in the school. But those who wish to spend but two of the three years in the school are earnestly advised to pass their first year of study, before entering, under the direction of a *competent* private instructor.

Unsurpassed facilities for operative and mechanical practice are furnished by the infirmary of the Massachusetts General Hospital which is open throughout the year.

F E E S.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is \$200; for the second year, \$150; for any subsequent year, \$50.

For further information address,

THOS. H. CHANDLER, Dean,

222 Tremont Street, Boston, Mass.

PHILADELPHIA DENTAL COLLEGE,

Nos. 108 and 110 N. Tenth Street, above Arch.

FOURTEENTH ANNUAL SESSION, '76-'77.



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D. D. SMITH, D.D.S., Professor of Mechanical Dentistry and Metallurgy.
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ALONZO BOICE, D.D.S., Demonstrator of Mechanical Dentistry.
J. FRANKLIN WARDWELL, Assistant Demonstrator.

THE DISPENSARY and Laboratory open all the year.

Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June. *Fall Preliminary Lectures*, commencing Monday, September 4th, will continue daily until November. Like the Spring Course, their object will be to anticipate subjects presented during the Winter Session. *The Regular Winter Course* commences Monday, November 6th, and closes on the last day of February ensuing. Three hours of each day will be devoted to attendance upon lectures, which will be illustrated to the fullest extent by a large and valuable collection of Chemical and Philosophical apparatus, and Anatomical and Pathological specimens. Tickets for the Course, including the Demonstrators', \$100; Diploma, \$30; Matriculation (paid but once), \$5. For further particulars address

J. H. McQUILLEN, Dean, S. W. Cor. 21st and Arch Sts.

T H E
MISSOURI DENTAL JOURNAL,

HENRY S. CHASE, M. D., D. D. S., Editor.

VOLUME VIII.

The Publishers of the Journal, being desirous of extending its circulation to the fullest possible extent, will send specimen copies to any part of the world on receipt of the address of dentists wishing to examine it. Address

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319 North Fifth Street,

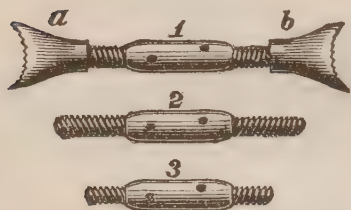
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DENTAL DEPOT.

Send for New Illustrated Catalogue.

JACK SCREWS.

Devised by Dr. C. S. LONGSTREET,
with Dr. A. McCOLLOM's Im-
proved Head.



This device is greatly prized by
those who have used it.

PRICES.

Full Set, as above, Nickel Plated,
screw and two extra bars...\$2.50
Jack Screw, Nickel Plated.....1.50
Bars, " " 50

Improved Triplex Rubber-Dam Punch.

Devised by Dr. F. W. DOLBEARE.
TWO STYLES, Nos. 1 and 2.

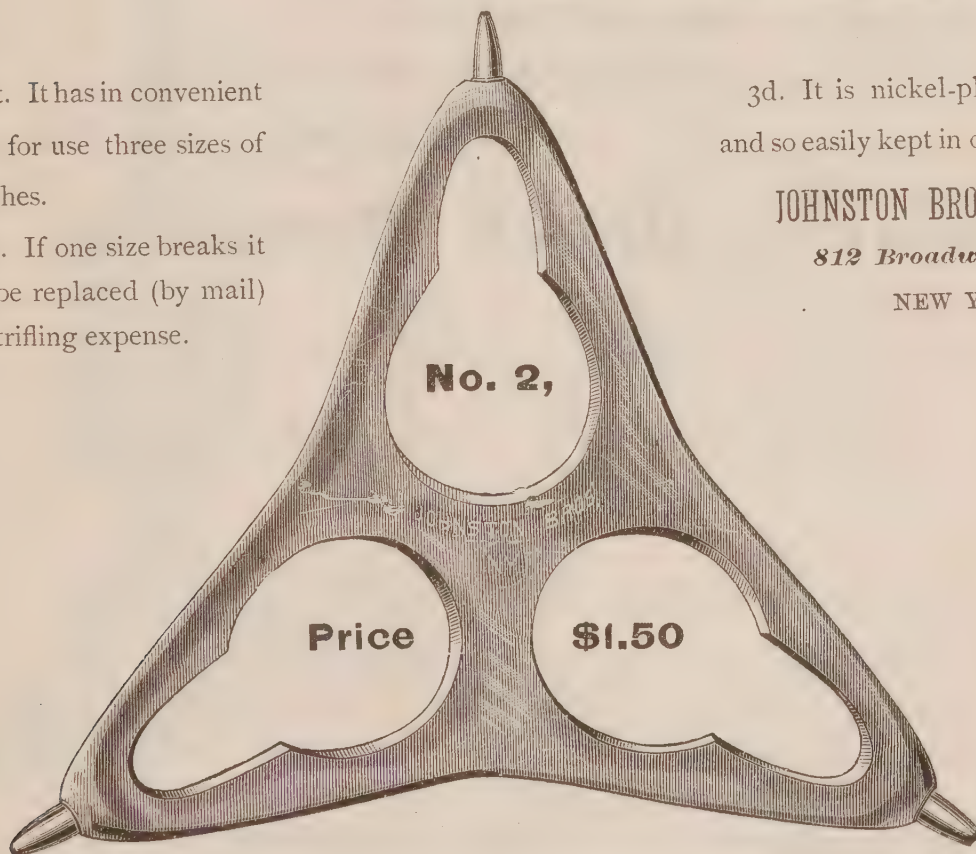


1st. It has in convenient
form for use three sizes of
punches.

2d. If one size breaks it
can be replaced (by mail)
at a trifling expense.

3d. It is nickel-plated,
and so easily kept in order.

JOHNSTON BROS.,
812 Broadway,
NEW YORK.

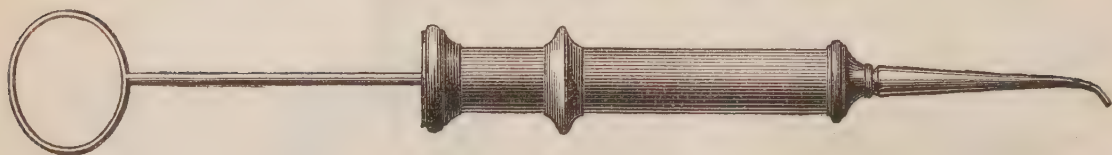


SECOND-HAND CHAIRS.

Dentists who have supplied themselves with the Morrison Chair, frequently request us to sell the chairs previously used by them. We therefore can ordinarily supply, at cheap rates, second-hand chairs of any of the varieties hitherto most used. For particulars, address

JOHNSTON BROS.,
812 Broadway, N. Y.

SYRINGE.



This syringe, of metal, nickel-plated, is represented half-size. It is provided with a spring, a suggestion from Dr. A. H. Brockway, so that if after use it is placed in water its piston rises and it fills itself with water, and is so constantly ready for use.

The points, straight and curved, are removable at will.

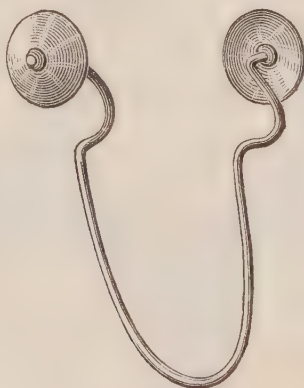
PRICES.

With one point, curved.....	\$2 25
With two points, one straight and one curved.....	2 50

JOHNSTON BROTHERS,

812 Broadway, New York.

Elliott's Cheek Distender.



Cut is $\frac{1}{4}$ size.

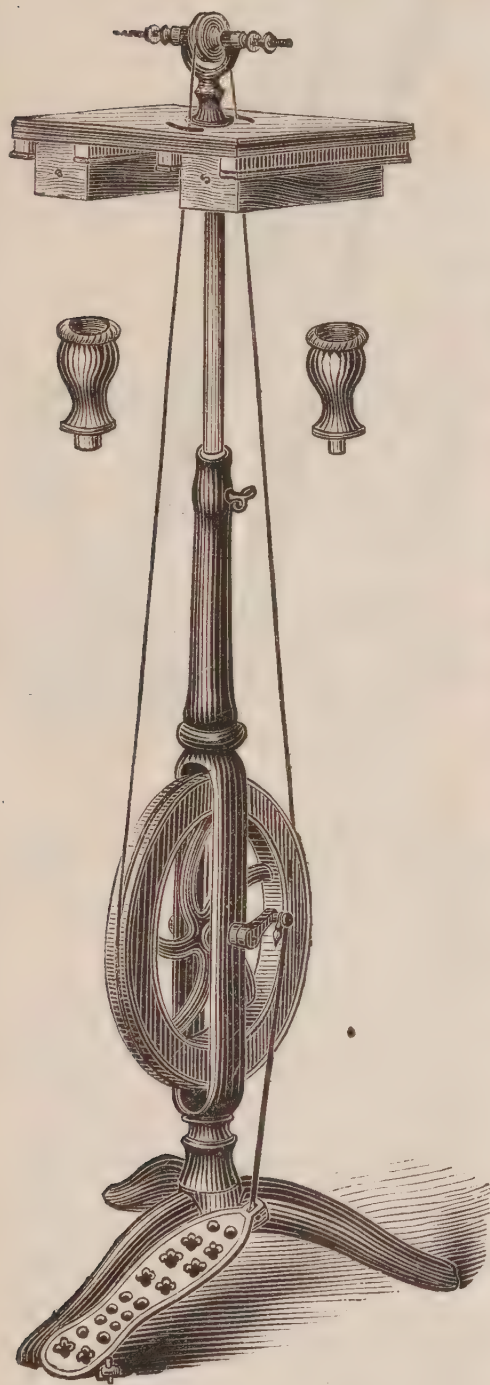
This convenient device, as its name implies, is designed to distend the cheeks of a patient during operations on the teeth.

Its bow of spring wire, and the cheek pieces are polished and nickel plated. It serves, in connection with its principal use, to reflect light on the teeth. As the spring is not stiff it is worn with very slight inconvenience. *This is proving extremely popular.* Price \$1.00.

JOHNSTON BROS,

812 Broadway, N. Y.

American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

Price of Lathe, with two Chucks,	-	-	-	\$18 00
“ Chucks, extra,	-	-	-	15

 No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

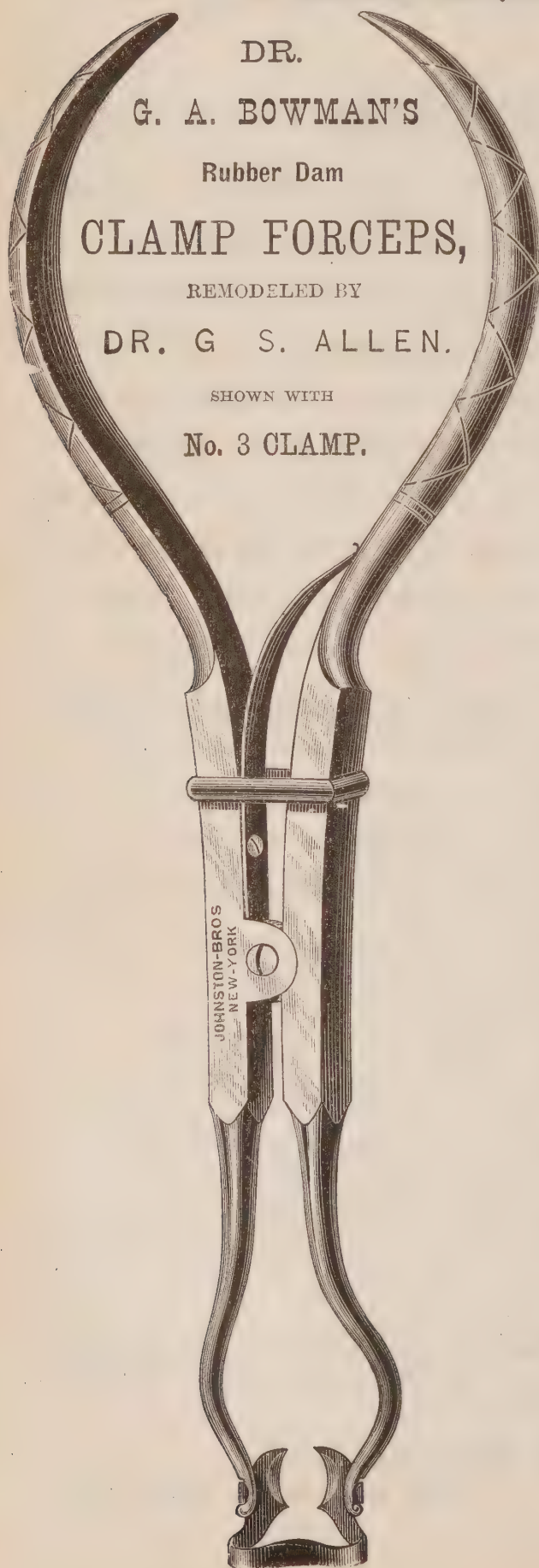
For Sale by

JOHNSTON BROTHERS,

812 Broadway, New York.

RUBBER DAM CLAMP FORCEPS.

Of these we offer two styles, both deservedly popular.



POINTS OF DR. T. C. ROYCE'S Rubber Dam Clamp Forceps,

Shown with Clamp. Handles are exactly like the other style, (Bowman's.)

Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

If so ordered we can supply either style of Forceps with a band, which will keep the Forceps and Clamp extended and ready for use when the hand of the operator is removed, as shown on the Bowman Forceps.

PRICES.

Forceps, either style	\$3.00
“ “ “ Nickel Plated....	3.50
Complete set of Clamps, embracing eight forms.....	4.00
Complete set of Clamps, embracing eight forms, plated.....	4.80
Clamps, each.....	50
“ plated.....	60

JOHNSTON BROS.

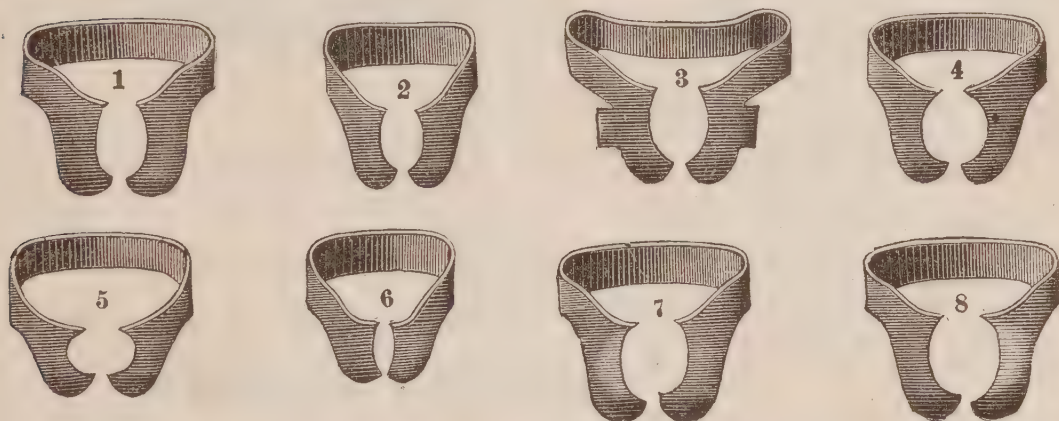
We were never more sure of doing signal service to the
Dental Profession than now in offering the

IMPROVED

Rubber Dam Clamps,

INVENTION OF

DR. DELOS PALMER, OF NEW YORK.



Price, set of Eight, { Oil finish, \$4.00. Each plain, 50 Cents
 { Nickel plated, 4.80. " Nickeled, 60

For use with Rubber Dam Clamp Forceps.

These Clamps are designed to be placed on the tooth at the commencement of the operation. Afterwards apply the Rubber Dam by passing it over both tooth and clamp.

DESCRIPTION.

Nos. 1 and 2.—Universal Clamp for Molars.

No. 3.—For posterior cavities in molars standing alone.

No. 4.—For third molars, or any molar of a cone shape. This Clamp can oftentimes be turned around while on the tooth, so as to place the bow of the Clamp out of the way of the operator.

No. 5.—For bicuspid.

No. 6.—For lateral and central incisors.

Nos. 7 and 8.—RIGHTS AND LEFTS.—For cavities under the gum, on the buccal or lingual surface of molars.

Cuts of two favorite styles of Rubber Dam Clamp Forceps will be found on another page.

These Clamps have prominent points of marked superiority over those of other manufacturers.

First. Each has been carefully adapted to the shape of the tooth for which it is designed, *under the personal supervision of Dr. Delos Palmer*, the inventor.

Second. A groove is made by us in the clamp, into which the forceps nicely fit, so that the clamps firmly hold their position on the forceps, when once adjusted, instead of tilting from one position to another—as is the case when no groove is provided.

JOHNSTON BROS.

WHALEBONE RUBBER.

Of this Rubber, the manufacturer states that it contains more than *double* the amount of gum to the pound than does any other dental rubber; that it will take and retain a higher polish; and that one pound of it will make eight sets of teeth more than one pound of any other rubber—it being so much lighter in proportion to bulk. Plates made of this rubber are so thin and springy that they will not rock or tip during mastication.

It is made from the most carefully selected materials, and will vulcanize in 55 minutes at 320 degrees Fahrenheit.

For lightness, elasticity, strength and polish, it is fully guaranteed to be the best in market.

Dentists supplied at all times, in large or small quantities.

Price, per pound.....\$3.50.

JOHNSTON BROTHERS,

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HOUGHTON'S OS-ARTIFICIAL.

IMPROVED.

ITS SUPERIOR QUALITIES ARE

Extreme Toughness,

Strength,

Flint-like Hardness,

and Insolubility after Hardening.

Put up in glass stoppered bottles containing nearly ONE-HALF OUNCE.

Price \$1.00. Sent by mail.

For Sale in any quantity by

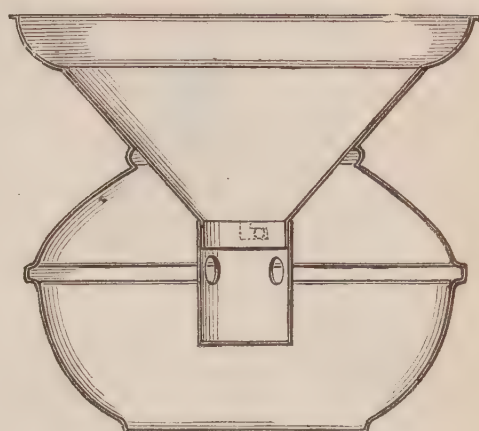
JOHNSTON BROTHERS,

812 Broadway.

NICKEL PLATED CUSPADOR WITH GOLD-TRAP.



CUSPADOR.



Section of the cuspador, showing the Funnel with gold-trap attached.

The cuts represent a metallic cuspador, handsomely nickel plated throughout, designed to fit the spittoon attachment of the Morrison Chair. As the funnel can be removed by simply lifting it from the Cuspador, all parts are as readily cleaned as is the porcelain Cuspador now in use. The gold-trap—which is an attachment of the funnel—will, in a short time, effect a saving sufficient to pay for the Cuspador.

PRICES.

Spittoon Bracket, plain.....	not pictured.....	6 00
“ “ “ “ “ “	“ “ “ “ “ “	8 00
Nickel plated Cuspador and Funnel with Gold-Trap..		\$10 00
Funnel and Gold-Trap.....		3 50

JOHNSTON BROS.,

812 Broadway, N. Y.

TOOTH BRUSHES.

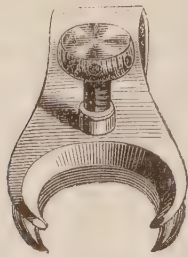
A first-rate article.

4 Row Brushes, per dozen.....	\$3 00
5 “ “ “ “	3 80
Children's Brushes “	2 30

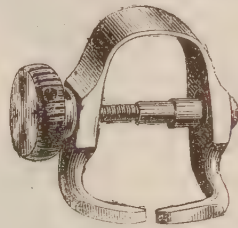
JOHNSTON RBOS.

Jarvis' Separators.

(PATENTED SEPT. 8, 1874.)



No. 1.



No. 4.

The cuts above shown are full size, and represent an apparatus for separating teeth. It is almost impossible to overstate the value and convenience of the devices. By their use, without delay to the operator or appreciable pain to the patient, adjacent teeth may be forced apart for any of the various purposes for which it has been customary to wedge teeth. Crowded teeth can be readily parted by using the separators, so that rubber dam can be applied without difficulty or loss of time. Two forms are shown by the cuts; of the first form we make three sizes, **No. 1, No. 2, and No. 3.**

The Separator consists of a piece of steel, nickel-plated, bent upon itself, having the two ends formed to fit the outer portions of the proximate surfaces of two adjoining crowns.

These jaws are forced apart by the action of a screw, which passes through one and against the other of them. This form is applicable to all the bicuspid and molars. It does not touch the gums or injure the teeth, neither does it cause pain sufficient to be of consequence. The whole instrument is drawn to a spring temper. The jaws are thin, in order to be out of the way, and also the more perfectly to adapt themselves to the surfaces of the crowns of the teeth than if they were rigid. The appliance may be left on, in many cases, while operating, or if removed the space gained by its use may be retained by inserting a wooden wedge.

The Compound Wedge, No. 4, consists of two wedges approaching or passing each other. This is especially applicable to the incisor teeth, and will be found particularly useful in making room for passing rubber dam around crowded teeth. In use, a small strip of wood should be placed over the teeth and beneath the cross-bar, to prevent the points from sliding towards the gum.

PRICES.

Complete Set of Four	\$6.00
Any Single Instrument.....	2.00

JOHNSTON BROS.,

812 Broadway, N. Y.

JACK SCREWS.--Old Style



LENGTH WHEN CLOSED.

LENGTH WHEN EXTENDED.

No. 1. _____

No. 1. _____

No. 2. _____

No. 2. _____

While the Longstreet-McCullom Jack Screw, advertised on another page, is in constant and increasing demand, instances occur where the style of Jack Screw here represented is useful. We offer two sizes, having the length shown in the above cut. They are made of the best steel, and nickel plated. Price each.....\$1.25

JOHNSTON BROS.

PHENOL DENTIFRICE.

A very excellent Tooth Powder, devised by an eminent practitioner in New England.

Bottles, per dozen.....\$3 00

Or Tin Cans, containing 1 pound..... 1 50

“ “ “ 4 pounds.... 5 00

JOHNSTON BROS.

FOIL CARRIER AND PLUGGER, COMBINED.

They are made of the size of cut, and with serrated points.

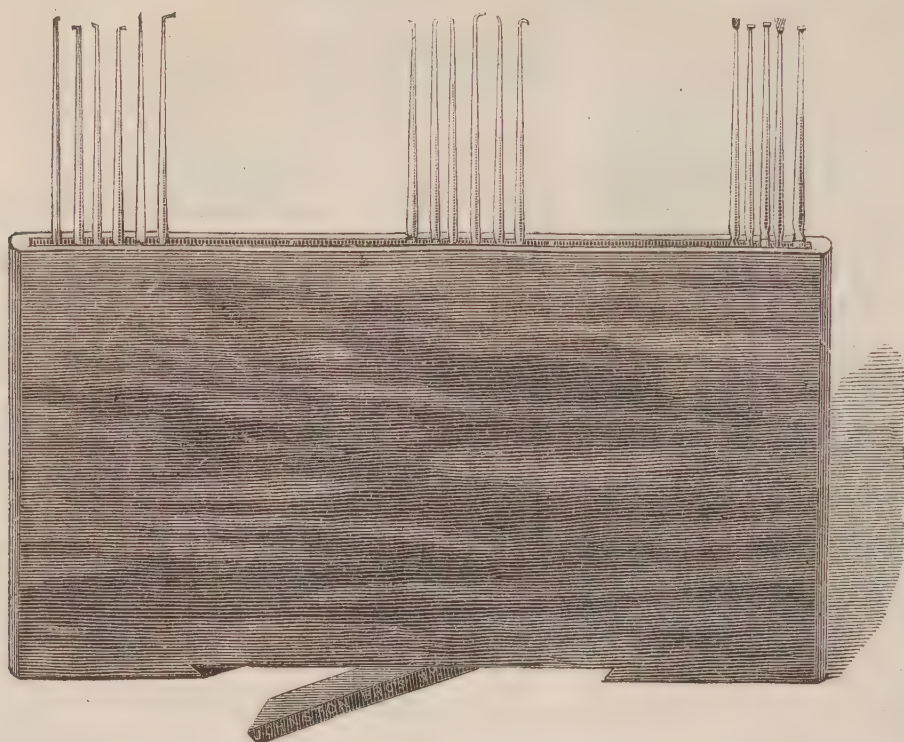
Price,\$2 00

“ Nickel Plated.... 2 50

JOHNSTON BROS.



Fitch's Instrument Stand.



Both time and money are saved by any arrangement by which a dentist's tools are so distributed that he can at a glance recognize, and conveniently lay hold of any desired point.

It is a further convenience, if, when night comes, he may lay them in his drawer secure from dust without disarranging them. Dr. Fitch, of Lee, Mass., has designed an instrument stand for hand tools which combines these advantages. When placed on the table for use it is firm in its upright position, and the point of each instrument in it is distinctly presented to view. When its foot is closed into its base it is but 5-8 of an inch thick, and can be laid flat in any drawer without disturbing the instruments.

We make two sizes—No. 1, for excavating burs, &c., having 3-16 inch handles ; No. 2, for pluggers, &c., having 3-8 inch handles.

Price of each.....\$1.50

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DENTAL DEPOT, 812 BROADWAY, New York.

JOHNSTON BROTHERS,

Manufacturers of,

Also Dealers in Every Description of Dental Supplies.

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A Price List of our Manufactures is being prepared, and will be issued in English, German and Spanish.

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Fabricants et marchands de toutes especes d'articles pour l'usage des Dentistes.

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L'argent Français, Anglais, et autres sont acceptées à leur juste valeur en or.

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Une liste des prix de nos fabricants va être imprimée en Allemand et Espagnol.

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DEPOSITO DENTAL, No. 812 Broadway, N. Y.

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Fabricantes y Traficantes en toda clase de materiales Dentales.

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JOHNSTON BROTHERS,

812 Broadway, New York, U. S. A.

Se está preparando una lista de precios de los efectos fabricados por nosotros que publicaremos en Aleman y Español.

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von

Gebrüder Johnston,

Fabrikanten aller in das zahnärztliche Fach einschlagenden Artikel.

Aufträge für das Ausland werden mit besonderer Sorgfalt ausgeführt.

Europäisches Geld zum vollen Tages-Cours angenommen.

Correspondenz in allen Hauptsprachen.

Bestellungen mit entsprechenden Geld-Eintagen adressire man

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Ein Verzeichniß unserer Fabrikate nebst Preisen wird in aller Kürze in deutscher Sprache erscheinen.

—1876—

JOHNSTONS' Dental Miscellany,

A NEW MONTHLY JOURNAL

OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

ITS CONTRIBUTORS ARE EMINENT WRITERS AND PRACTITIONERS.

It will contain Prize Essays upon the important improvements of the day.

It will contain illustrated articles from DR. NORMAN W. KINGSLEY, on the Treatment of Cleft Palate, Deformities of the Mouth, Regulating of Teeth, &c.

The commendation of the Miscellany received during the last year has gratified its publishers greatly. They purpose to make the volume for 1876 superior in all respects to either volume that has preceded it. This will be—

1st. Through more frequent contributions from the regular writers who have hitherto favored it, and by promised essays from equally capable practitioners, who have not as yet written for its pages.

2d. By the further reproduction of engravings upon dental subjects. Three such have already appeared, and others are in course of preparation.

3d. By the constant search for, and publication of items of office practice, which serve to show the methods adopted by eminent and experienced dentists to overcome the little perplexities of every-day practice, and to shorten the operations in both laboratory and operating room.

In short, it shall be the constant effort of the editor and publishers to make the Dental Miscellany of practical value to every actively employed dentist, as well as a source of literary enjoyment to its scientific readers.

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JOHNSTON BROTHERS, Publishers,

812 BROADWAY, NEW YORK.

VOL. 3.

No. 32.

Johnstons' Dental Miscellany,

A MONTHLY JOURNAL OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

AUGUST, 1876.

NEW YORK:
JOHNSTON BROTHERS,
812 BROADWAY.

JOHNSTON'S

DENTAL MISCELLANY,

FOR 1875.

It is certainly reasonable cause of self-congratulation on the part of the publishers of this Journal, that the end of the first year of its publication finds it with a large and constantly increasing list of subscribers, and that they are constantly in receipt of letters of encouragement and commendation from their readers in every section of the country, and even from distant portions of the world, one such letter being recently received from Japan.

We are promised one or more articles from each of the following gentlemen of established reputation, and others of like standing in the profession have encouraged the expectation of like favors from them.

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 Dr. WM. H. ALLEN, New York.
 Dr. J. B. MORRISON, St. Louis.
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 Dr. A. C. CASTLE, New York.

Dr. T. H. CHANDLER, Boston.

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JOHNSTONS'

Dental Miscellany.

VOL. III.—AUGUST, 1876.—No. 32.

FACIAL NEURALGIA.

By TRIGEMINIS.

The etymological signification of the term neuralgia is nerve-pain. But, as pain is only sensation exaggerated, and the nerves are the organs of sensation, it might be inferred that all painful sensations are neuralgias. Ordinary painful sensations, although transmitted by the nerves, are the result of lesions of the parts to which the nerve is distributed; whilst in neuralgia, the pain is due to an idiopathic affection of the nerve itself. Hence it is found convenient to limit the signification of the term to that manifestation of pain in a part, and to irritation of its nerve, not at its terminal distribution, but at some antecedent point of its course.

Pain is the distinctive characteristic of neuralgia, and it is only necessary to constitute a neuralgia, that there should be an abnormal and persistent condition giving expression to pain in a nerve. Sensitive-nerves only are subject to neuralgia, for however motor-nerves may be diseased, the lesion, lacking, as it does, the element of pain, cannot be called a neuralgia.

Facial neuralgia is not neuralgia of the *facial* nerve, but of the parts about the face. It may manifest itself in the eye, ear, cheek, forehead, or lower jaw, and is as maddening as any ailment to which flesh is heir. It is confined to no age, sex or condition. Those most subject to it are the cachetic, the anæmic, the nervous, the pregnant female, and those of a syphilitic or malarial diathesis, the affection being modified according to the peculiar cachexy. Its paroxysms are irregular, sudden,

intermittent, more or less frequent, and very exhausting. The pain is variously described as darting, lancinating, burning, ramifying, etc.

The most trivial matter may induce a paroxysm—the slam of a door, a breath of cold air, an acrid taste, a jarring sound, an attempt to laugh or sneeze, is sufficient to excite it. The patient is anxious and uncertain, dreading the shock, but not knowing when or whence it will come. As time goes on the attacks become more frequent and severe, unless there is great systemic improvement or modification of the cause, and the patient gradually becomes wasted and exhausted.

There are no external signs of heat, redness or swelling to manifest its presence. Pain, pain is the only symptom, and personal experience alone indicates its position or maps out its track. Its origin is frequently very obscure, and as various as its other features. Many causes may induce it, and often it is to be diagnosed only by exclusion. But we have to do with it now only as due to irritation of “diseased teeth.”

Fully three-fourths of the cases of facial neuralgia, I think, may be ascribed to dental irritation, besides many cases of neuralgia of the neck, shoulder, arm and head. It therefore behooves the dentist to study well this most troublesome affection. Many hours of distracting suffering and many hard-earned dollars might be saved to suffering humanity, if the enlightened physician would but recognize the potency of this cause, and refer the case to its legitimate sphere.

That the pathology of this affection may be duly appreciated, it will be necessary to consider briefly the anatomical structure and physiological relations of the parts. The Fifth Pair of Nerves is the great organ of sensation of the parts about the face, and has a wide range of function and sympathy through its plexuses and ganglionic connections. It is the most acutely sensitive nerve of the body, and the last to yield to anæsthetic influence. Its division is followed by insensibility of the skin of the face and of the adjacent mucous membranes. Its three great divisions are the Ophthalmic, Superior Maxillary, and Inferior Maxillary. The first division sends branches to the ophthalmic ganglion of the great sympathetic, to the parts about the eye, to the nose, and to the integument of the forehead and scalp. The second division supplies the upper teeth, the antrum, the lower lid, cheek, nose and upper lip. The third division is a mixed nerve, containing motor and sensitive fibres, and also the nerve of special sense, taste. It gives sensibility to the temple, the external ear, the lower teeth, chin, lip and inferior portion of the face. The ophthalmic and Meckle's ganglia are

the great supply-depots, and points of connecting-lines for the first and second divisions; and the otic and submaxillary ganglia for the third division. We thus have a perfect net-work of nerve-telegraphs, associating all these parts in close relationship and active sympathy. The many connecting links and anastomoses render it an easy matter for an impression to be conveyed from one point to any other point.

The current of nerve-sensation flows from without inwards, and the impression made upon the sentient extremity of a nerve is conducted to the brain, there to be registered, the nerve trunk always registering the impression peculiar to its termination. The brain seems to have become so habituated to this sort of thing, that any irritation anywhere along the course of the nerve is taken cognizance of, and referred, not to the point of irritation, but to its terminal filaments. A familiar illustration of this is to be seen in the case of an amputated limb, where the patient suffers pain in the fingers or toes long since lost, from an irritation of the nerve in the cicatrix. It is another well-established principle of reflex nervous action, that an impression, sensitive or motor, may be reflected from one point to another through the sympathetic system. Convulsions in children may follow the irritation of ingesta in the intestinal canal; and indigestion frequently induces amaurosis, strabismus, double-vision, etc.

Nausea and capricious appetite frequently accompany the peculiar condition of the uterine mucous membrane in early pregnancy. Similar examples might be cited in numbers. Thus an edentulous patient may suffer toothache from pressure of a plate upon the gums. Some nervous filament is irritated, and the impression being conveyed to a nerve-centre is reflected along a dental nerve, and registered as having been made upon the terminal filaments in the tooth long since lost. This is an apt illustration of any case of facial neuralgia due to "diseased teeth."

We have now demonstrated the possibility of neuralgia of the fifth pair from dental irritation, and shown its rationale; its actual existence daily experience proves.

What are some of these "dental irritations"? An exposed pulp is a fruitful source of trouble. The exposure may be very obscure, yet causing violent neuralgic pains in the eye, ear or face without exciting the suspicions of the uninformed. A tooth in the upper jaw may ache from an exposed pulp in the lower, and vice versa; or all the teeth upon one side may ache when but one is involved. It is sometimes a difficult matter to convince a patient that a particular tooth, or any

tooth, is the cause of trouble. The writer has had to satisfy them by arresting the pain in an upper tooth with an application of chloroform to the lower, then re-exciting it by irritating the pulp of the lower, and then finally curing the case by extracting the tooth.

A dead tooth is always a weak point in the system, and is very susceptible to irritation of all kinds, local, systemic or sympathetic. It therefore induces many neuralgias. Indigestion, malaria, or cold, induced by exposure or wet feet, will manifest themselves here, and be followed by facial neuralgia. This chronic condition of the parts predisposes to neuralgia more than the acute irritation of pulp exposure. A tooth containing a pulp which has died spontaneously seems to be even more apt to be the exciting cause of neuralgia than one dying subsequent to filling. A dead tooth—one with the roots properly filled—one the subject of abscess properly treated—one containing a dead pulp, the result of thermal shock through a metallic filling, but not abscessed, and one containing a spontaneously dead pulp—is thus a very predisposing cause of neuralgia.

Acidity of saliva, by increasing the sensitiveness of even superficial caries, may induce it. The writer has traced obscure neuralgia to galvanic action from the presence of gold and amalgam in the same cavity; and so, too, it may follow the contact of different metals in adjoining or antagonizing teeth, or of a gold clasp and an amalgam filling.

Accumulation of tartar, greater or less, according to the susceptibility of the patient, sometimes produces it.

Another cause is the denuding of the cementum by the recession of the gums from the necks of the teeth. Wisdom teeth impacted in the jaw, roots of teeth, exostosis, calcification of pulp, mercurial salivation, in fact, any or all of these causes, singly or combined, and any other dental irritation, may be the palpable or hidden cause of this painful and troublesome malady.

Reason says that dental irritation may, and experience proves that it does, induce facial neuralgia.

The treatment has been as varied as the extent of the materia medica, every ingredient of which, in all possible combinations and with every imaginary mode of application, has been used with different measures of success claimed for each. Every prescription has its peculiar virtues, and every old woman has her certain specific. Different remedies certainly do affect different individuals according to their varied susceptibilities. The principles of treatment would, however,

seem to be very simple. It must be palliative or radical. The radical is nothing more than the discovery and removal of the cause.

Remove the cause and the effect will cease. The indication, then, in each particular case, is the same as if unaccompanied by this complication, and suggests itself immediately.

The palliation treatment consists in the use of anodynes, liniments, emollient applications, and counter-irritation to the part. Chloroform, ether, aconite, oil of cloves, oil of peppermint, oil of cinnamon, etc., enter into nearly all of the prescriptions.

Quinine, bromide of potash, chloral and morphine will all be found useful adjuncts. Section of the trifacial nerve is never necessary in pure facial neuralgia from dental irritation.

OUR LONDON LETTER.

EDITOR DENTAL MISCELLANY:

SIR: Now that your ever-active compatriots have fixed upon a likely candidate for the Presidency, opened your grand Centennial Exhibition, and started an Administrative Reform Association, we may be allowed to expect the advent of the holiday period, and those who take a more immediate interest in dental matters may find time to look around on their professional affairs. I therefore venture once more to encumber your pages with my discursive remarks.

Here, as with you, dentists seem to be partaking of the restless reforming spirit of the age. The air is heavy with rumors, and the professional journals are *very heavy* with dental matters. Not to be behind-hand, the advertising fraternity has lately been exercising its ingenuity in gulling the "Intelligent British Public." Not a bad thing in this way was an advertisement which appeared in a popular "daily," toward the end of the last game season. It was to the effect that "Mr. Blank, Surgeon Dentist, of so and so, returned thanks for the present of game received on," etc., etc. As the announcement appeared several times, the present of game must have been unusually large, to have repaid the profusion displayed by the grateful recipient; however, I suppose the game must have been a paying one, or it would not have been carried on. Another game was an insertion in the "agony column" of a daily paper, to the following effect: "Dearest —: Teeth a great success! Nine roots removed without any pain! Teeth re-

placed and answer beautifully ! Mastication perfect, detection impossible ! Go to the same place, immediately opposite so and so."

I think, sir, that these specimens of advertising ingenuity might prove useful to some of a like kidney in your country. To say the least they are clever, and infinitely preferable to the plan adopted by one unscrupulous person among you, of dragging the name of a respectable practitioner through the mire to serve his own unworthy purposes. I have seen with regret that Dr. Field, of London, has been mentioned in a Philadelphia paper as one of the few dentists in this wide world whose rooms come up to the standard of a Dr. Perine, of New York. Now, sir, Dr. Field is in practice here, as becomes a professional man. He relies upon his skill for his livelihood, and makes no pretensions either to "Cuspadore, or Gold Fish," nor to gulls of any kind, which may feed on what fish they may catch. He is highly indignant at the way in which his name has been made use of in this matter, and as he is a retiring, undemonstrative gentleman, I hope you may see your way to publishing this statement.

The New York Odontological Society's transactions have come to hand, got up in the usual excellent manner, and containing a large amount of readable and instructive matter. What a contrast between this volume and the reports of a certain academy (heaven spare the mark !), with its committees and correspondents, electro-galvanic cautery and such like ! If the original genius who came to Europe to perfect his knowledge of the subject had but a limited acquaintance with the literature of his (unfortunately *his*) profession, he might have referred to the English journals of sixteen or eighteen years ago, or to society reports, and found a full account of Mr. Harding's experiments on this subject, and his application of it to dentistry, but I suppose such an ordinary method of acquiring information would not suit the soaring ambition of that energetic gentleman. It is a great pity that the O. S. of New York and other kindred respectable societies should have such unscrupulous and—to coin a word—unmeetable conduct to retard them in their good work. The dreary *vis inertiae* of the mass of dentists is quite enough to have to drag along the road of progress.

The Odontological Society of London has its troubles also. A few disappointed and consequently discontented men have found out that this Society, whose object has ever been to unite the profession, is too lax in the admission of members, and instead of proposing alterations in the laws of the Society, they have formed "An Association of Sur-

geons Practicing Dentistry." Some of these gentlemen have not the L.D.S. and have not accomplished the curriculum for it, and they hold that a man must be a Surgeon first and a Dentist afterwards. I need hardly at this time of day say that any conscientious Surgeon would make small professions to Dentistry on the strength of his medical and surgical studies *per se*, but by the new Association all unsuccessful Surgeons are invited to have a turn at Dentistry, as something within the scope of their stunted surgical abilities, and besides they are held by it as superior to the man who has conscientiously worked for the degree which has been offered him as a qualification for the practice of Dentistry. This new Association has, however, managed to get the ear of two of the medical journals (probably on the strength of the wide field of enterprise it opens for many of their incapable readers) and one of these, out-heroding Herod, has attacked the propriety of men holding the L.D.S. degree only administering anæsthetics, and advises the medical profession to look for the remedy and for safety to the members of the new Association. The "puff direct" could hardly go further than this, and the editor of the *Monthly Review of Dental Surgery* has lived to see his pet idea of advertising skill carried out to perfection. Electric cautery and gold fish with you ; anæsthetics and surgical diplomas with us. Was ever a struggling profession so overloaded with such contemptible self-seeking ! The article I have alluded to called forth a protest from twenty-five London practitioners, fifteen of whom hold hospital appointments, all of them hold other diplomas besides the L.D.S., and as the signatures were gathered in a single day, some names were unavoidably left out. This list is instructive when compared with the list of the new Association, which, as a writer in one of the journals truly says, contains only one name which is revered in the profession, while many of its members are residing in the provinces, and have little or no insight into the mischief caused by the false step of joining this movement. How sad it is that so small a power should be so potent for harm; yet such is the case, and the progress of dentistry has here received a wound the scar of which cannot be effaced for many years to come. It is, however, gratifying to see that the old Institution holds its own. The energetic President began the session with a conversation, which was a complete success, both as regards members and arrangement. The interest of the meetings has been well sustained, and never for years has the average of attendance been so large.

The formation of Dental Hospitals goes on apace here, and now the movement has spread to the sister Isle, where Mr. O'Duffy seems to be

the moving spirit in establishing one in Dublin. As all such institutions are supported by voluntary contributions, the labor connected with their establishment and maintenance is immense.

Despite the disaffection of a few dissatisfied men, backed by some who ought to have known better, the Dental Diploma of the Royal College of Surgeons is steadily gaining ground; and the College has issued a notice that no students' certificates shall be acknowledged unless signed by a D.D.S. It has also made the preliminary examination required by candidates for the membership of the College incumbent on the candidates for the Dental Diploma. The subjects for the examination I may epitomize as follows: 1st, Compulsory. Reading aloud; writing from dictation; grammar; composition; writing a short description of a place or some natural product, or the like; geography; history; mathematics, Euclid, books I and II; algebra to simple equations inclusive; Latin translations from 2d book of Cæsar's Commentaries, Dr. Bello Gallico. 2d, Optional. The subjects are six in number, one to be chosen and not more than four to be selected. Greek, German, French, involving questions in the grammar of each. Mechanics, chemistry, botany and zoology. The rule will come into force after October, 1877. This will greatly strengthen the hands of the Dental Reform Committee, an association formed for the purpose of acquiring for Dentists a legally defined position on the grounds of compulsory education and registration.

In the midst of all these dry-as-dust professional matters, a sprightly little article which appeared in the *Dental Register* is quite refreshing. I hope the author will pardon me for saying I do not know of a passage in Byron alluding to the toothache. The expression "Hell of all diseases" occurs in Burns' address to the toothache. Here is the verse:

"When fevers burn, or ague freezes,
Rheumatics gnaw, or cholic squeezes;
Our neighbour's sympathy may ease us,
Wi' pitying moan;
But thee—thou hell o' a' diseases—
Aye mocks our groan !

The man who wrote the article is, I am sure, too genial to object to being set right even by an obscure scribbler like me.

"Long may *his* soul o'er his old face
(Howe'er its features may be shaded)
Still throw the sunshine of its grace,
And keep the moral part unfaded."

And long may he be able to infuse a blink of lightness into our literature.

By the way, if "Expression is the face's soul," how much both soul and face must owe to Dentistry! I wish I could think the debt were always one of gratitude.

VAGRANT.

THE SAND-BLAST.

By W. S. WARD.

Prof. William P. Blake, in a communication "On the Grooving and Polishing of Hard Rocks and Minerals by Dry Sand," which appeared in the *American Journal of Science and Arts*, September, 1855, describes the phenomena observed by him in 1838, in the Pass of San Bernardino, California, as follows: "On the eastern declivities of the pass, the side turned towards the desert, the granite and associate rocks which form the sharp peak San Gorgonio extend down the valley of the pass in a succession of sharp ridges, which, being devoid of soil and of vegetation, stand out in bold and rugged outlines against the clear, unclouded sky of that desert-region. It was on these projecting spurs of San Gorgonio that the phenomena of grooving were seen; the whole surface of the granite over broad spaces was cut into long and perfectly parallel grooves and little furrows, and every portion of it was beautifully smoothed, and, though very uneven, had a fine polish." While contemplating these curious effects, the solution of the problem was presented. The wind was blowing very hard, and carried with it numerous little grains of sand. A closer examination disclosed the fact that the whole of the polished surface was enveloped in an atmosphere of moving sand, and it was through the grinding and rubbing of these minute but numberless quartz-atoms that the rough surfaces of these rocks had been made smooth, and the natural grooves deepened and polished. "Even quartz," he observed, "was cut away and polished; garnets and tourmaline were also cut and left with polished surfaces. . . . Whenever a garnet or lump of quartz was imbedded in compact feldspar and favorably presented to the action of the sand, the feldspar was cut away around the hard mineral, which was thus left standing in relief above the general surface."

The traveler whose good fortune it is to visit our Western wonder-land, will note among the many fingers in his guide-book one pointing in

the direction of the now famous Monument Park. Entering a narrow valley bordered by mountain-walls, he will find himself gazing in wonderment at the rounded stone columns, rising about him in groups or singly, to a height ranging from ten to forty feet, and in many instances surmounted with grotesque cap-like coverings, that rest balanced upon the frail pinnacles of the rock-columns. An inquiry as to



FIG. 1.—SAND-CUT COLUMNS IN MONUMENT PARK.

the causes of their existence, standing as they do in isolation on the surface of the valley low-lands, will elicit the reply that they were made by the wearing away of the surrounding rocks by sand, which, whirling about in water or air eddies, acted like chisels of the turner's lathe. Where the depressions were deepest there the rocky strata were soft and yielding, and were the more readily cut away ; but where the opposing

surface was hard, as in the case of the black cap-pieces, the action was less rapid, and the reduction of the rock less decided. Glancing off from these, the whole force of the driving sand was projected against the strata immediately below, thus reducing it in size till there seems hardly circumference enough left to sustain the weight above.

So much for the observations of the geologist and explorer, made nearly half a century ago, and placed on record as forming but one of the many startling features of that wonderful region, but suggesting to the traveler little else than a reasonable theory by which to account for a hitherto mysterious class of physical phenomena. From this, the record of the student of Nature, we turn to a second record, more practical in character, and having a direct bearing upon the subject under review.

Whether the author or inventor of the modern sand blast deserves any less credit for having had his idea anticipated in the workshops of Nature, we will not say; certain it is, however, that the former work suggested the latter, though the prior claim does not seem to have been considered by the American Commissioner of Patents.

“On the 18th of October, 1870,” we read, “letters-patent of the United States were granted to General B. C. Tilghman, of Philadelphia, for the cutting, grinding, etching, engraving, and drilling stone, metal, wood, or any hard substance, by means of a jet or blast of sand.” We are also informed, from the same official source, that the inventor of the sand-blast process obtained his first hints from Nature, and, by means of a mechanism which is a marvel of simplicity, has been able to utilize this same force so as to make it render most efficient service in several departments of the applied arts.

It is the object of the present paper to describe and illustrate the invention known as the Tilghman Sand-Blast, an invention which, in simplicity of construction, and yet extent of application, has hardly an equal in the annals of the American Patent-Office. We are aware that this is a broad claim, when it is remembered that under the protection of the same authority the sewing-machine, reaper, and mower, positive-action loom, and a score or more of great mechanical devices, first saw the light. It is possible that there is that in the idea of the sand-blast which adds to its charm, and secured for it the admiring endorsement of Torrey, Tyndall, and other men of science; and yet a careful study of its principle, and an observance of its practical operation, seem to justify all and more than is claimed for it by the inventor or his distinguished endorsers.

If the reader will refer to the simple "claim" as given above, he will notice that it is proposed to accomplish the several results there named "by means of a *jet* or blast of sand." The italics are our own, and are now introduced since it is in this idea of a *jet* of sand that the first principle of the device rests; and, moreover, it was an attempt made by others to adopt this falling jet of sand that compelled the inventor to institute his first proceeding against infringement. With the legal history of the sand-blast, however, we have nothing to do, save as it concerns the general history of the invention and its progress. In order that the methods by which a simple falling column or stream of sand is made to do service as an engraver of glass and metal plates may be understood, attention is directed to Fig. 2, which may be described as follows:

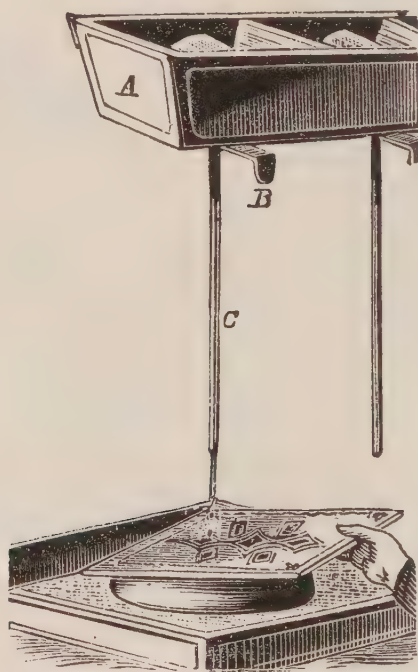


FIG. 2. DEVICE FOR ETCHING WITH SAND.

A is a box, elevated as high above the engraver's table as the height of the ceiling will permit. When designed for several workmen, this box may be divided into compartments, as indicated, each compartment being filled with common quartz or sea-sand, of varying degrees of fineness. From the bottom of each division a metal tube, *c*, depends, reaching to within a few inches of the table below. A slide, *B*, serves to regulate or check the flow of the sand. Thus much for the simplest form of sand-blast. A word as to the manner of its operation; and here, again, reference must be made to the original "claim," where it will be found that the operation of the blast is limited to the cutting,

grinding, etc., of any *hard* substance. It may be well to note the significance of this word *hard*, since in it lies the secret of the whole process. The substance upon which the sand acts must be a hard or brittle one, falling or being blown upon which, the angular sand-grains chip away minute portions, till at length the whole surface is reduced or scratched to any desired depth. Thus, if the plate which, as shown in the figure, be a glass one, and the workman wishes to engrave on it a flat design, he has only to protect the portions which are not to be acted upon, by a stencil made from rubber, soft iron, leather, or even paper, since these substances, not being *hard* or brittle, will not be affected by the descending blows of the sand-grains. This the workman has done, and by this means he has been able to depolish or grind the surface of the plate as indicated. Of the methods of constructing and applying these stencils, their variety and several uses, descriptions will be given as we advance.

From the use of a simple jet of falling sand, we pass on a step, and in Fig. 3 present the Tilghman Sand-blast Machine, in its original and complete form, all subsequent improvements having been made only with a view to some special form of service. The feature of this device, it will be observed, is the use of a blast of air or steam which shall be made to accelerate the falling of the sand through the tube, and thus cause each grain to act with additional force upon the opposing surface. If the reader will, by the aid of the illustration, observe closely the construction of this simple device, he will be able to comprehend, once for all, not only the novelty of the invention, but also its extreme simplicity.

Connected with a wooden box, supported on a shelf, as here indicated, is a flexible rubber tube, which in turn is attached at its lower end to an iron tube, that rises through the floor of a miniature wagon. This wagon rests on the roof of a box through which a slit is cut in the direction shown. Through this slit the iron tube passes, projecting into the box below. It is to the structure of this metal tube, or gun, as it is called, that attention is specially directed. As shown in the section at the right, it consists of two tubes, the one leading down from the box and conveying the sand being smaller, thus allowing of an annular space between it and the lower section. Into this lower section, and at a right angle to it, the blast of air is admitted from a suitable reservoir. The sand falling down, as shown by the upper arrow, enters the lower tube at a point below that at which the air is admitted. Having passed below the limits of its conducting-tube, it receives an

extra impulse from the air-current that also is passing downward, and by it is projected with greater force upon the *hard* substance below. In addition to the advantage gained by this new impulse, it will also be seen that the blast serves another purpose in blowing away the sand, so soon as its work is done, and thus leaving the surface below clean and in a condition to be the more readily acted upon by the succeeding blasts. The purpose of the wagon is merely to admit of the tube being moved forward and backward along the line of the plate to be engraved, the lateral movement of the plate being effected

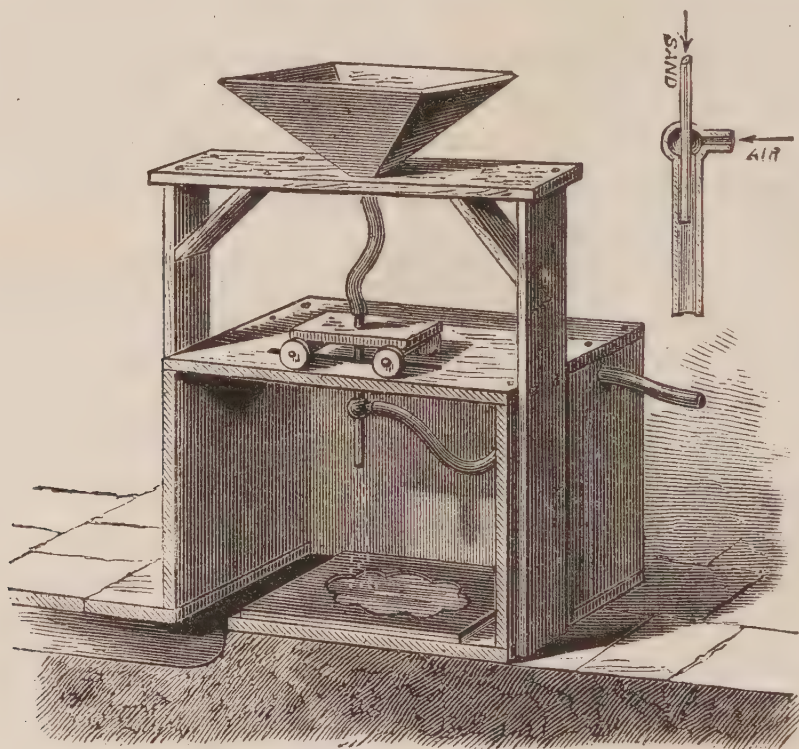


FIG. 3.—THE TILGHMAN SAND-BLAST MACHINE.

by a suitable device not here shown. This plate is enclosed in a box, for the reason that the falling grains of sand, while they chip away the surface of the plate, are also broken up and powdered. And it is that this dust may not interfere with the health and comfort of the workmen that the whole is confined in a closed box.

Before describing the several methods by which, through the aid of specially-prepared stencils, the surfaces to be treated are exposed to the action of the blast, we will direct attention to certain of the more recent forms of the machines, all embodying the same general principles, but so modified as to adapt them to the special service for which they are intended.

Foremost among these devices is the large machine, by the aid of which flat plates are ground or engraved.

The distinctive feature of this machine is the substitution of a long, narrow slit for the tube; through this the sand falls or is blown in a

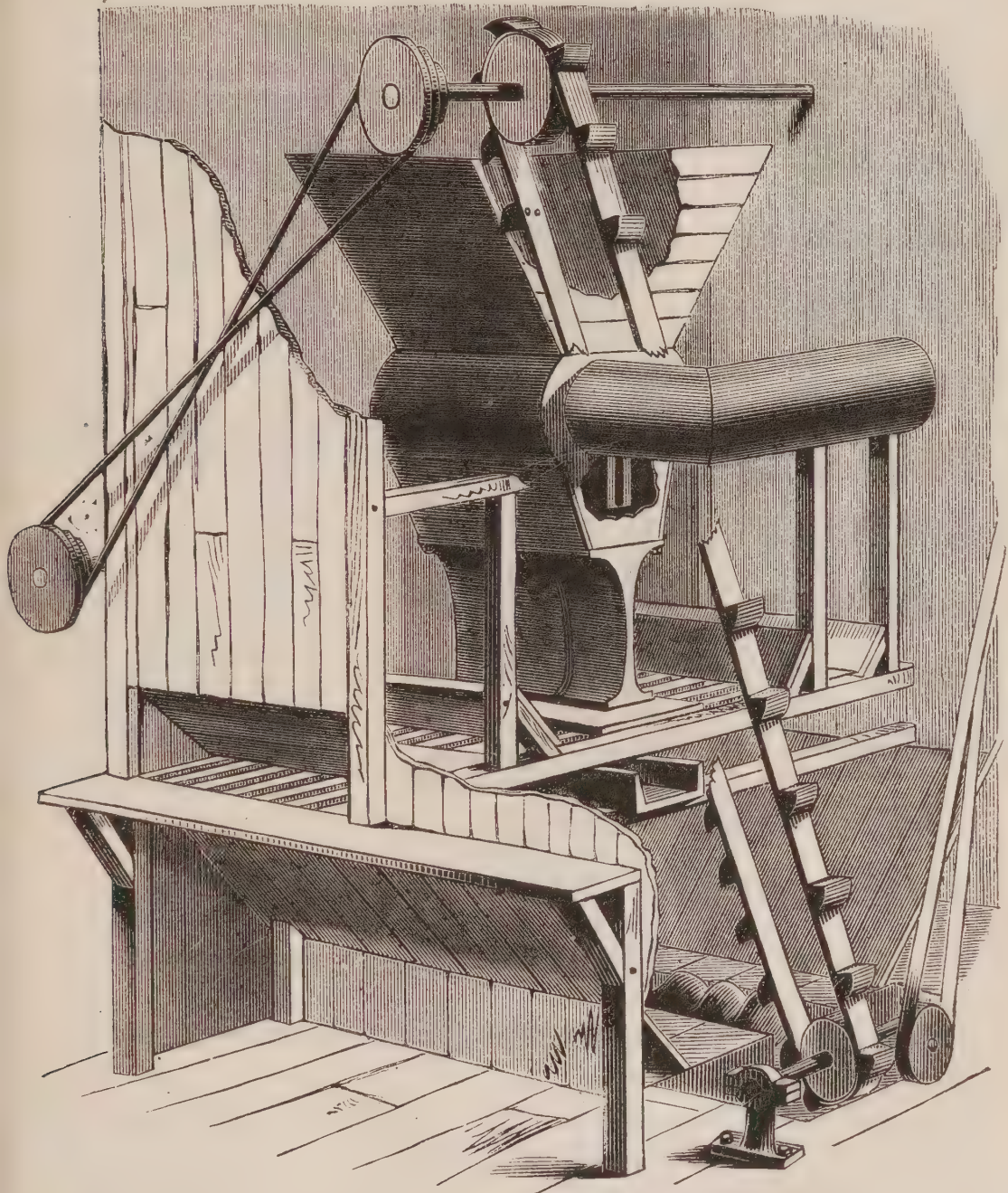


FIG. 4.—MACHINE FOR ENGRAVING FLAT PLATES.

thin sheet. Referring to Fig. 4 we find the machine composed of a large supply-box, into which the sand is elevated by a series of hoppers attached to a moving belt. From this box the sand falls of its own weight into a second receptacle, which serves also as a receiving chamber for the air-blast that enters at the right through the large blast-pipe.

From this receiver the sand is driven downward through a second slit, and emerges from it with great force.

At right angles with this slit a series of leather straps or moving belts serves to convey the polished plate beneath the sheet of falling sand, and it is during the passage of the plate under this sand-sheet that its surface is depolished or ground. As these plates move at the rate of



FIG. 5.—PLATES ENGRAVED BY SAND-BLAST.

from six to thirty inches a minute, an estimate can be made as to the rapidity with which the work of grinding is effected. When it is desired to merely roughen the whole surface, it is evident that no preliminary processes are needed, the plates of glass being fed in at the opening indicated on the right, and passing through to be received and delivered at once as ground glass.

When it is desired, however, to engrave figures or designs upon the plates, a special process precedes the grinding. This consists in the designing and attaching of the stencils, and may be described as follows: The glass plate, which it is proposed to ornament with any suitable device, is laid upon the designer's table and covered over its whole surface with a thin sheet of tin-foil. Upon this bright metallic surface the designer sketches his pattern, and then by the aid of a sharp knife-point cuts through the foil along the lines of the pattern. The foil, which

indicates the design, is then carefully lifted and removed, leaving the glass exposed, showing the exact form of the pattern. The plate is then removed and placed upon a second table, where it receives over its entire surface a thin layer of melted wax. When this wax has become sufficiently hardened, a knife is introduced beneath the portions of foil that remain, and these are gently lifted and removed with the wax immediately over them. What remains now is the original pattern traced in wax and resting on the glass. The plate thus prepared is then placed on the moving belts, or feeders, of the large machine, and by them is conveyed under the falling sand-blast. Of course, this sheet of sand

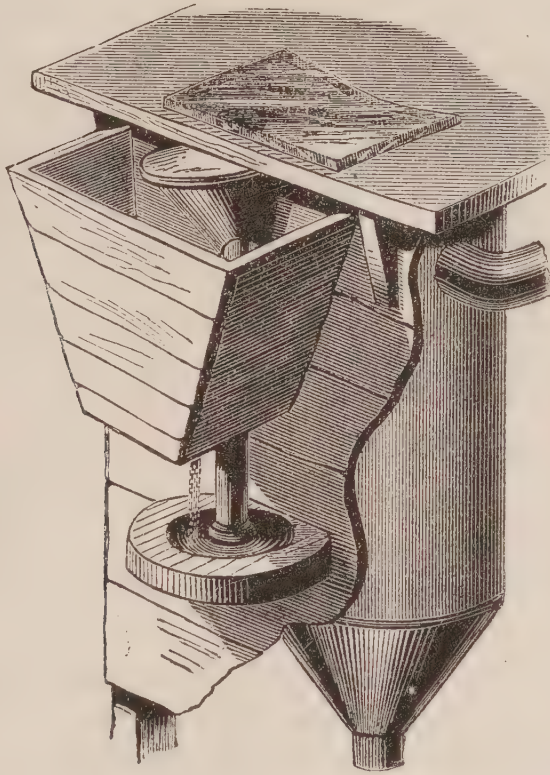


FIG. 6.—MACHINE OPERATED BY EXHAUST INSTEAD OF BLAST.

strikes with equal force on the whole surface ; but where the wax layers intervene they act as shields, receiving the sand but checking its progress, while the exposed portions being glass, and therefore brittle, are roughened so as to present the appearance of a ground surface. After each plate passes through, it is again slightly heated, the wax removed, and the final appearance is such as indicated in Fig. 5. These illustrations, it may be stated, are from photographic imprints, taken from actual plates, and, as such, indicate with perfect exactness the character of the work. In these the light portions represent the ground

or depolished surfaces, while the dark lines are those which, having been protected by the stencil shield of wax, were untouched.

When the surfaces to be acted upon are curved, as in the case of globes, tumblers, etc., a special device is needed. The feature of this is an exhaust-chamber, by the aid of which the sand is drawn up through a tube and projected upward, as shown in Fig. 6. Immediately above the orifice through which the sand rises, the stencil-covered globes are caused to revolve on spindles.

If the reader has been able to follow this necessarily brief description, he will readily perceive how, by the use of duplicate stencils, construct-

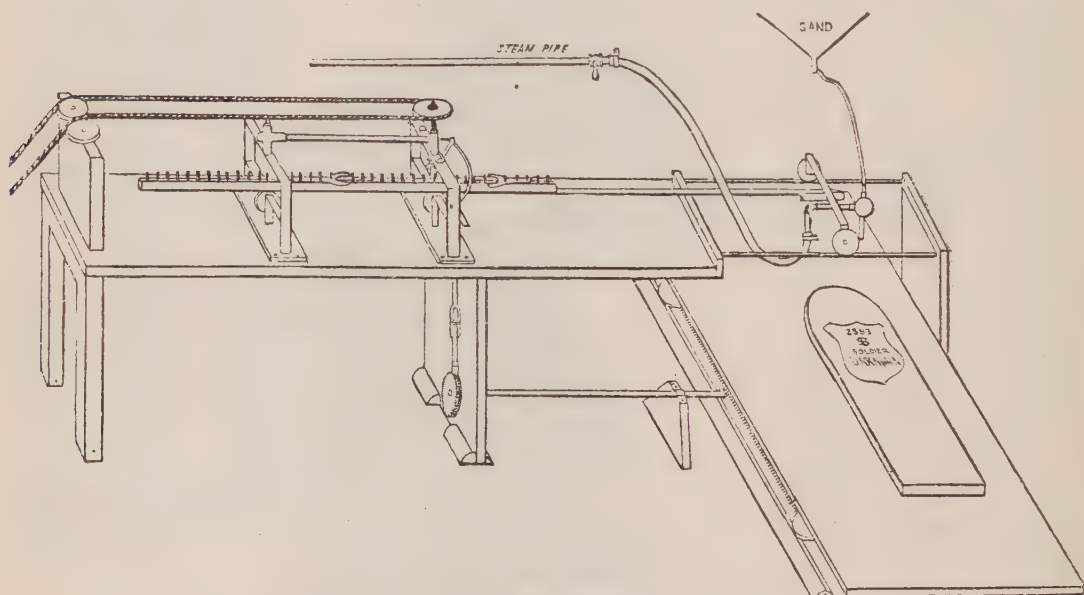


FIG. 7.—TILGHMAN'S SAND-BLAST STONE-MACHINE.

ed of any tough substance, the work of engraving, once an art in itself, becomes merely a mechanical process. As the result of experiments, now nearly completed, a form of rubber ink has been devised, which, when laid on paper, converts it into a stencil, sufficiently tough to resist the action of the blast. Then, again, it may be seen how designs, direct from Nature, may be transferred to glass or metal by merely attaching a leaf or vine to the surface, and exposing it to the action of the blast. Nor is glass the only substance that can be ground and engraved. All metals, when hardened, are as readily cut. The zinc plates which are now being substituted for lithographic stone have their surfaces depolished by the sand-blast. As illustrative of the remarkable rapidity with which the sand-blast accomplishes its work, the following facts, regarding the cutting of inscriptions on the head-stones designed to mark the graves of soldiers buried in the national cemete-

ries, may be cited. The contractor having this work in charge at Rutland, Vermont, has three sand-blast machines, of the form indicated in Fig. 7.

In addition to the one man employed to tend these machines, he has a small force of boys, whose duty it is to attach and remove the cast-iron letters which act as stencils. Thus equipped, the contractor is able to turn out three hundred head-stones a day, upon each of which is a handsomely-cut inscription averaging eighteen raised letters. It is estimated that, to accomplish a like result by the old process, a force of three hundred men would be needed. Another instance of the rapidity with which these little sand-engines do their work is shown in the engraving of glass globes, tumblers, etc., which can be done at the astounding rate of one a minute.

Extended space might be devoted to a mere recital of the actual present accomplishments of the sand-blast, and, were we to enter the field of speculation as to its possibilities, the range of its adaptation would tax the reader's credulity. We will therefore be content to refer to the following extract from the report of the judges at the fortieth exhibition of the American Institute, which, in awarding the inventor the great medal of honor, describes and commends his invention as follows :

“The process is designed to execute ornaments, inscriptions in *intaglio*, or relief, or complete perforations, in any kind of stone, glass, or other hard and brittle substance ; or to cut deep grooves in natural rocks, in order to facilitate the process of quarrying ; or to make circular incisions around the central mass of rock in the process of tunneling ; or to remove slag, scale and sand from the surfaces of metal castings ; or to clear the interior surfaces of boilers or boiler tubes of incrustations ; or to cut ornaments or types from wood as well as from stone ; or to depolish the surface of glass, producing by the aid of stencils or other partial protections, as the bichromatized gelatine of photographic negatives, every variety of beautiful figures, including copies of the finest lines, and the most delicate line-engravings ; or to prepare copper-plates in relief for printing, by making gelatine photographic pictures upon smooth surfaces of resin and pitch, cutting them out by the blast, and afterward moulding from them, and electrotyping the moulds.

“This process is without precedent. The use of sand in sawing marble, or in grinding glass by common methods, hardly furnishes an analogy.”

Here follows a description of the device, concluding with the statement that "it is regarded by the judges as being one of the most remarkable and valuable inventions which the age has produced."

When it is announced that the judges who thus emphatically endorsed the claims of the sand-blast were Profs. Barnard, Mayer and Morton, our readers will demand of the writer no apology for or qualification of his expressed opinion that the "Tilghman sand-blast is an invention which, in simplicity of construction and extent of application, has hardly an equal in the annals of American patents."—*Popular Science Monthly*.

INFLUENCE OF THE MIND UPON THE BODY.

By N. W. WEBBER, M.D.

Of late, the mutual relations of mind and body are better understood than formerly, and as a consequence many of the phenomena which result from this union have, in the light of this knowledge, been stripped of the marvelous, to be recognized ever after as the simple sequence of certain conditions. The antecedents of these phenomena have been the subject of much discussion, some claiming that they arise from natural causes, that they are inevitable, that born in man as a part of his constitution, there is no escape from them. Others claim that there is a self-determining power, controlling, modifying or destroying both antecedent and sequent, substituting something baser or nobler in its stead.

The first says: "I am what I am—a creature of necessity;" the second, "I am what I make myself;" and then again, such men as John Stuart Mill say, "Although our character is formed by circumstances, our own desires can do much to shape those circumstances, can modify our future habits or capacities of willing." Orthodoxy in religion and science has so long taught us that for "man so noble in reason, so infinite in faculties, in apprehension so like a god," to be affected by his externals, to surrender his judgment, and succumb to the trickeries of his imagination, is something beneath and unbecoming the dignity of one possessing those faculties.

Whatever may be the case with a normal mind, if such a one exist, we cannot say, but I think the fact is recognized that there is no one with such a perfect mental equilibrium as to be unaffected at all times and under all circumstances by his surroundings: that his self-determining

power is, under certain circumstances, weakened. In some persons this happens rarely, and in such a slight degree as to be scarcely perceptible; in others, so frequently and markedly as to destroy all free moral agency, and render the person so changed little better than an imbecile or a lunatic. The charlatan, if not understanding this condition of the human mind, has unconsciously taken advantage of it, and often with such marvelous results, as at last to open the eyes of the scientific observer and compel him to recognize its potency. The intolerance of dignity has too long hampered us in our investigations, and placed us too often in the relation of the hare to the tortoise in the race after truth. If disease can be tricked out of its territories more successfully by the subtleties of diplomacy than by the grape and canister of pill and potion, the victory is just as great and the spoils of an unexhausted, unravaged system still greater. If the human mind in its symmetrical development can be so invigorated as to control the function of every organ of the body, mold it into its normal shape, and harmonize it with the whole, it is important that we understand it; and again, if from inherited or acquired weakness, the mind can be worked upon as upon the battery of the telegraph, responding to every touch in disturbed functions, among the tissues of the body, it is still more important for us to know that. How does the mind in the vigorous, healthy display of its energies affect the body? All of us have, with all our admiration for the beauty of the innocence of childhood, been more than repaid for its loss in the development of a still greater beauty, indicating mental growth and activity. The soft, smooth skin and graceful curves of puerility have been replaced by grooves, and furrows and angles, that tell that thought has harrowed up the soul, and that intelligence is the product of its cultivation.

The bones of the skull have ossified and attained their full size at or about twenty, but the instrument of the mind incased within those unyielding walls has not attained to its maturity until about forty. The cultivation of the possibilities of that brain not only reflects itself in beautifying to its highest type the countenance and body, but it produces an actual change in the shape of the head, not only as a whole, but also in particular and distinct regions. Elam mentions the case of a friend who had two casts taken of his head at the interval of several years, during which time he was entirely devoted to artistic pursuits, which he had adopted late in life. The contrast between the two is very striking in the development of certain parts of the forehead and parietal regions. What is true of individuals is also true of nations, as

may be seen in the change of shape of the skull of the Magyar race, who are a branch of the great North Asiatic stock, and who, since their expulsion ten centuries ago, have changed their type of cranial conformation from the pyramidal or Mongolian, to the elliptical or Caucasian. This is the result not of intermarriage with Europeans, but of culture and intellectual growth.

The probabilities are, that the different types of mankind which have been designated by the shape of their skulls would never have existed had their civilization or intelligence remained the same. Dr. Carpenter gives figures of different skulls of Englishmen preserved in the Museum of the Royal College of Surgeons, presenting some of the characteristics of the pyramidal and prognathous types. In a mixed crowd of persons of Caucasian blood similar deviations can be discovered, and in these deviations we recognize the various degrees of intelligence.

As regards the effects upon the bodily health of a rigorous cultivation of the brain soil, there has been considerable diversity of opinion. Some contend that hard, protracted study is hurtful, undermining the constitution, and rendering it a prey to all kinds of disease; while others are of the opinion that brain work, intelligently prosecuted, is not only uninjurious, but absolutely conducive to good health and longevity.

The shattered constitutions that have resulted from the attempts at a high development of the mental powers have been found where originally the soil was poor, where from some inherent defects the powers of endurance were very much diminished, and where the same results would have attained in the course of time from natural causes.

Elam, taken from Dr. Madden's "*Infirmities of Genius*," has tabulated a list of natural and moral philosophers, sculptors and painters, authors on law and on medicine, and in their attainment of years we find them averaging 75, 70, 69 and 68, while we find that such familiar names as Franklin, Lowenhoeck, Newton, Goethe, Le Sage, John Wesley, Voltaire and Rollin, all lived earnest, energetic brain workers to eighty and upwards. The great havoc that is made in the lives of our merchants and business men from nervous diseases is due to worry and fretting, and not to mental work. Very many of this class are men of limited education, with little or no mental discipline, exuberant or depressed with the rise or fall of stocks, presenting a brave front in fair weather, but in foul, if protracted, fuming into apoplexy or driving into dementia.

The influence of the mind in warding off, controlling and curing

disease is well known and appreciated by the intelligent physician. In epidemics, it is an unquestioned fact that the mortality list is very largely increased in consequence of the moral panic that results. The mere mention of cholera will blanch the cheek of many, and this class, when subjected to the epidemic influence of this disease, are the very first to succumb to it. On the other hand, a cheerful frame of mind, engendered and sustained by an indifference to epidemics, generally results in an immunity from the disease prevailing.

Should the disease attack such an individual, the same moral equilibrium will most often carry him through successfully. Not only is this principle correct as regards acute diseases and epidemics, but it is also correct as regards protracted chronic ailments, when exerted in the wrong direction, or in speedily curing them, if in the right.

The history of miraculous, of magnetic, or of spiritual cures, brought about in answer to prayer, or as the effect of some specific power resident in the humbug who performs it, is simply history repeating itself, and these have their counterparts in the "royal touch," Perkins' tractors, the weapon ointment, and other kindred nonsense that has flourished and died out in the past. That these things are, and have been, proves that the large mass of mankind is capable of being deceived; that they seek to be deceived, and that they will be deceived. It is, however, unquestioned that the nervous diseases in which these agencies have such a potent effect have too often a veritable existence, and it is perhaps the fault of the regular profession that they have made too light of them, or have not been so assiduous in their relief as the exigencies of the case demanded. Our modern civilization has multiplied the symptoms of nervous disease, and in its manifestations it is so multifarious that it is difficult to tell where the imaginary shades off and the real begins. Local organic diseases are mimicked with a truthfulness that is bewildering, calling for the most critical examination to detect them, and if detected, they can only too often be recognized as a symptom instead of a disease—a symptom of nervous derangement. We have hysteric joints and spines, hysteric aphonia, paralysis, cough, pain, and many others, where it is very difficult to tell that they are hysterical. All of us have had to do with one or the other of these various manifestations of a faulty nervous system, recognizing some of them, perhaps, as exaggerated cases of actual disease, which, ordinarily, would attract no attention, and others as perfectly visionary. Paget says of this class of sufferers that they love to be cured with a wonder, and they often pass out of the hands of the careful scientific physician unbenefited, to be

cured with *eclat* by some audacious worker in mesmerism, or vender of patent oil. This class of cases cannot be set down as altogether imaginary, or at least not as fraudulent. The pains and aches they suffer are veritable realities to them. They have nursed these pet joints, weak spines, or paralyzed limbs, until their whole mental life centres on the diseased point—exulting, unconsciously, perhaps, in their martyrdom. Something as attractive to their minds can only usurp their disease, and the flattery of special Divine interposition, a marvelous cure, or the inexorable necessities of sick relatives, fire, or a lost fortune, will do the deed. The early history of medicine is so interwoven with mythology, astrology, magic, witchcraft and humbuggery, that the small amount of wheat is almost lost in the vast quantity of chaff; and as theology and medicine, in those days, went hand in hand, they mutually supported and confirmed each other. So amulets and charms, as they protected from and cured disease, proved the truth of the religion in whose service they were used. This superstition is not entirely rooted out in the present day, for the test of the truth has been, and is, made on these grounds.

Spiritualism, Protestantism, Catholicism, Mohamedism, and many others, have claimed to be the only *ism* from this evidence of Divine favor. The effects of the mind in modifying, ameliorating and curing disease is so well known to the intelligent practitioner, that the marvelous and apparent miraculous is divested of all that is surprising, and proves no more for the creed of the Christian than for that of the heathen. All such evidence to prove the truth of any religion, and all such evidence offered as being supernatural or Divine, is injurious to the cause or creed it attempts to bolster up. Quackery, which is antithetical to all that is pure and good, can boast of more that is miraculous, in the common acceptation of the term, than all the creeds together. Physiological discoveries, additional appliances, and scientific competition, have done much during the last twenty years for the relief and cure of the sick, but I believe that nearly, or quite as much, has been done by this power of mind upon the body. This influence has in a great measure been produced unconsciously by the physicians, yet none the less effectually. When we predict that a medicine will produce specific results, our expectations are generally realized. In this prediction we assist the virtue of the medicine by producing an expectancy on the part of the patient. Physiological experimentation has taught us that mercury has no effect upon the liver, and could we impress this fact upon the minds of our patients, the hepatic secretion

would diminish with every dose of this potent remedy, notwithstanding the observation of years has taught the contrary. Physicians are given to riding hobbies sometimes, and the reason that unbiased observers are so often unhorsed over the same ground is, that they are less assured in their sitting, and fail to secure a reciprocating expectancy on the part of their patients. The reason one physician secures such results from a remedy as to give it the name of specific in certain ailments, while another can only secure negative results, is often on account of the different modes of administering it. The first says : "You take this medicine every three hours, and to-morrow you will be all right." Another will say : "If you are not benefited by this when I return, I will change it for something else that, I think, will do you good." On the same principle one doctor is successful in practice, while another, with perhaps more ability, may fail. The first is decided, and wins ; the second vacillates, and loses. The confidence of merit that secures its reward in the true physician becomes inflated assurance in the quack, and too often the increased circulation of the one satisfies the masses as well as the true ring of the other.

A majority of the sick will get well if left alone to their own unaided recuperative powers. A certain proportion of the balance will recover or die in proportion to the skill displayed in their treatment, while the remainder will inevitably die under any treatment. The first class are in a great degree responsible for the various forms of quackery and over-medication. They insist on having their ailments doctored, and their requirements are met and the demand supplied. From this class the material for many a wonderful cure is furnished, and as there is often a rivalry as to who can furnish the severest sickness, with its dismal concomitants of aches and pains, to groan and sigh over, so also is the same passion manifested in the means and manner of cure. From the second class, where skill and experience are needed to conduct to a happy issue, an occasional recruit is furnished the ranks of the quacks. Very many impostors are men of ability ; their volubility is great ; their powers of persuasion are immense, and as they cater to the weak points of their patients for the sake of gain, they succeed sometimes where the more conscientious fail.

Like the electro-biologist, they suggest that they are recovering, induce an expectancy which overpowers the physical disability, and recover they do. Many of the phenomena of magnetism and spiritualism can be accounted for on the same principle. A state of expectancy is induced in the susceptible so great as to overshadow the common

sense of the individual, and they see, hear, feel and smell whatever is suggested. Dominant ideas, in the same way, take such possession of the mind as to produce bigotry and intolerance, and anything, no matter how absurd, in the line of thought or consistent with this possession, can be made a veritable reality. The hermits and *recluses* of old, living in a continuous atmosphere of piety, their minds filled with the thoughts of heaven and the angels, had these thoughts and feelings reflected back in visions that to them were real. Preoccupation of the mind by certain thoughts will color almost any sense impression to correspond with those thoughts, although the connection between the two may be most absurd—so that ghosts, voices, odors, etc., are produced under the most dissimilar and opposite conditions. The imitative tendency is so strong in some as to overcome the will power and produce phenomena strange and wonderful. The dancing mania of the fourteenth and fifteenth centuries is a striking example of this kind.

Many other phenomena, strange and peculiar to the unreflective, under the examination of ordinary common sense degenerate into the commonplace, and impress upon our minds the truth, as expressed by Dryden, that

Our reason was not vainly lent,
Nor is a slave, but by *its own consent*.

[From the Detroit Review of Medicine and Pharmacy.]

FAC-SIMILE TELEGRAPHY.

Mr. W. E. Sawyer has, we are informed, perfected an apparatus for transmitting telegrams in such a manner that the printing apparatus at the receiving office shall record the message in a fac-simile of the sender's hand.

The system is capable of transmitting over a single wire from 50 to 150 words per minute, against a possible 30 to 40 by the Morse system, which is that now in common use. But by this system a person's own handwriting is transmitted by telegraph, the same as though sent by mail, and, in brief, simply accomplishes letter-writing by telegraph. In order to render its operation fully understood, it may be described as follows :

First, the sender of a message writes it upon ordinary white paper ; the written message is then laid upon a metallic plate and passed between two rollers, with the effect of transferring the copy to the plate,

which may be done any time within ten hours after writing. Then the plate containing the copy is placed upon a semi-cylindrical holder which traverses a little track, and the instrument is set in motion, the whole operation up to this point having been accomplished in less time than it takes to write it ; whereas, by the Morse system, quite a number of minutes elapse before the message reaches the operator. The metallic plate is a conductor of electricity, while the lines of writing are non-conductors. Over the cylindrical plate are carried metallic points upon revolving arms ; whenever the point is upon the metallic surface, the electric current passes through to the wire ; the instant a point touches a line of writing, the connection is broken and a dot is made upon chemically prepared paper, placed upon a similar instrument at the receiving point.

The two instruments operate synchronously, *i. e.*, the moment a point is passing over the surface of one instrument, it is followed exactly by the point on the other instrument. An ingenious mechanical arrangement perfects the transmitting powers and prevents the possibility of one instrument gaining over the other. At the same time the points are moving over its surface, the plate is moved slowly horizontally, so that the entire surface is traversed. The transferred message is, of course, in reverse, but is brought straight by running the receiving instrument in an opposite direction. Each instrument is fitted to either receive or transmit, at pleasure. The rate of speed varies according to the closeness of the writing ; the points traversing the entire surface of the copy, it is immaterial as to the number of words, only the space they occupy requiring a given time to be gone over. Ordinary writing will be transmitted at the rate of from 50 to 100 words per minute.

The message, as received, is ready at once for delivery, and appears in close, dark blue dotted lines, on white paper. There is no loss of time in counting words at the sending station, as is now the case, nor delay in getting to the hand of the operator ; but in a quarter of a minute's time from its being received it is silently speeding its way to its destination, and automatically preparing itself for delivery. The wonderful facilities of the system render it peculiarly adapted to a large and hurried business. It is the fruit of many years' close application, hence the perfection with which it makes its appearance.

The writer of a message is, of course, as usual, supplied with blanks. In the system proposed—and which is now being perfected by the company already formed to utilize the invention—for whatever may be

written upon the blank he will pay an invariable sum of money, if under 250 miles ; if over, double that amount, in stamps to be furnished by the company, and used the same as postage stamps. Whatever is written upon the blank, whether 5 words or 50, will be sent for the same amount. It is so much blank passing through the instruments, and no cognizance is taken of its contents.—*Iron Age.*

BROOKLYN WATER SUPPLY.

By T. B. CORBALLY, M.D., of Kings County Medical Society.

Extract from Proceedings of the State Medical Society, June, 1876, as published in The Sanitarian.

It appears that the question of procuring a proper supply of water for Brooklyn was first agitated in 1834, when the city contained but 23,000 inhabitants. It was then proposed to sink wells near the foot of Fort Green, from which the water was to be forced by steam pumps to a reservoir upon the summit of the hill. In 1847 the subject was again brought up by a committee report, advising the construction of immense wells at the foot of the south-east slope of the hills at the rear of the city ; the water to be raised by steam-power to a reservoir forty feet above the tops of the houses on the Heights.

Again, in 1849, the well-system was advocated, but received a severe blow through the report of Dr. Torrey, that the Brooklyn well-water contained $18\frac{1}{3}$ grains of solid matter to the gallon, or $14\frac{1}{8}$ grains more than the Croton water, and hence was ill adapted to domestic uses.

Various plans were suggested, and from time to time voted upon and rejected, until in 1855 a company was chartered under the name of the Nassau Water Company, with power to construct works and to supply the city with water. Their plans included an open canal from Jamaica Pond, designed to intercept all the smaller streams between the pond and the pumping-engines. On the 1st of January, 1855, the new City Charter, incorporating Williamsburgh and Bushwick with Brooklyn, came into effect, giving a fresh impetus to the water question. Under the authority conferred by the charter, negotiations were established between the Nassau Water Company and the city, the result of which

was an arrangement whereby the city obtained a controlling power in the direction of the Nassau Company by the subscription of \$1,300,000, the company to conduct the construction of the Works, in trust for the city, pending the passage of a law enabling the latter to assume absolute proprietorship. A contract was at once entered into with H. S. Welles & Co. to construct works guaranteed to yield 20,000,000 gallons per day, within two years from the date of contract. On the 31st of July, 1856, the Works were formally commenced by breaking ground for the Ridgewood Reservoir. From that time the work of construction rapidly progressed, until March of 1857, when a change in the character of the conduit east of Jamaica was found advisable, it having proved impossible, in the unstable sands, to construct an open canal that would continue reliable and efficient. Through delays attendant upon the change in the plan, operations upon this portion of the work were delayed for more than a year. The remainder, however, was actively pushed to completion; and on December 12, 1858, the long-looked-for supply was placed at the disposal of the citizens of Brooklyn. Thus, after a twenty-five years' agitation of the water question, its solution was ultimately attained, and the people have continued uninterruptedly to enjoy the convenience and protection of an agent which has contributed more than any other to the advancement of the growth and prosperity of the city.

TOPOGRAPHY AND GEOLOGY OF THE COUNTRY.

Long Island, upon the western extremity of which the city of Brooklyn is located, extends in an easterly direction about 114 miles, with a varying width of from 10 to 20 miles. Geologically considered, the Island is of very recent origin, having been formed almost wholly by glacial agency. The ground is full of worn masses of stone, with surfaces often deeply scored by obstacles over which they have been urged with resistless force during their transportation. Side by side with boulders of trap from the Palisades, dark trap and sienities from the Hudson Highlands, and the Taconic range, with occasional masses from the Lower Helderberg, with their characteristic fossils, lie the gneiss and marble of Westchester, the slaty shales of the Hudson group and the red sandstones of New Jersey, together with many other varieties of rock, the counterparts of which still abound northward and north-westward of the Island. These, mixed in extreme confusion, and packed with the water-worn particles of their débris, comprise what is known to geologists as the unmodified Drift. Throughout the entire

length of Long Island runs an irregular chain of hills of from 150 to 384 feet in height, the northern spurs of which form the abrupt and diversified North Shore; while on the south, the surface slopes gently away toward the sea, terminating in a gravelly plain, which skirts the shores of the bays with a varying width of from 5 to 15 miles. The material composing the ridge of hills consists of the compact drift already described. Boulders are everywhere abundant, and isolated beds of clay fill many of the depressions on the elevated grounds, rendering them quite impervious to water. This character is lost as the slope descends, and layers of fine, uniform-grained sand, beds of pebbles and gravel, and occasionally local deposits of clay in thin strata, characterize the ground to great depths. Through this porous material the waters flow toward the ocean, bursting forth at various points in springs, forming streams of singular clearness and purity. It is from the larger of these streams that the water supply of Brooklyn is derived.

The principal source of supply, and the most distant point from which the water is taken, is Hempstead Pond, situated 12.39 miles from the pump-well. It is fed by two streams, rising a short distance from the town of Hempstead. These streams unite south of the town, and the subsequent course of the stream is marked by a succession of ponds of varying dimensions. The main pond, at which the conduit terminates, approaches the form of a square, with a rectangular projection at the entrance of the stream. Its water-surface embraces $23\frac{1}{2}$ acres, and stands, when full, $10\frac{1}{2}$ feet above tide. The drainage area extends over $25\frac{3}{4}$ square miles, stretching north-easterly from the pond. Its storage capacity is 5,364,000 gallons, and its minimum daily flow 7,800,000 gallons.

The pump-well, from which the water is drawn by the engines, is built of heavy granite masonry laid in courses with hydraulic mortar. The bottom, also of granite in radial courses, rests upon a bed of concrete, beneath which is a heavy platform of timber. The surface of the bottom is two feet below the bottom of the conduit. The interior of the pump-well is divided into compartments by cross-walls, to admit of the examination and repair of either pump without interfering with the other.

Upon the plain near the foot of the hill occupied by the Ridgewood Reservoir, and by the side of the pump-well, stand the pumping-engines, three in number, enclosed in a substantial, if not ornamental, structure of brick, with brown stone trimmings. The two chimneys for producing draught for the furnaces are 100 feet in height, and consist

of two concentric shells of brick, with an annular air-space between them for 80 feet of the height, the diameter of the interior shell being five feet. At each stroke of the pump a volume of water equal to $135\frac{1}{2}$ cubic feet, or 1,059 gallons, is raised into the reservoir. As the ordinary number of revolutions made per minute is 11, within that short space of time nearly 12,000.

When the water was first introduced, the average daily consumption barely exceeded 4,500,000 gallons, or at the rate of 25 gallons per day for each inhabitant. This consumption has continually increased, not alone in its total amount, but also in the rate proportioned to the population, which has now reached 46 gallons per capita, 1874, and at the present time, 1876, to upwards of 100 gallons per capita. This increase in the rate per head is due in a measure to the increased facilities for disposing of waste-water, which the extension of sewers affords, and to a growing recklessness upon the part of the people in the use of an element apparently so abundant. It is also in part due to the growth of manufacturing industries. The average daily demand for water during the year 1872 was 22,700,000 gallons. The demand reaches its maximum in the coldest part of the winter and in the heat of summer.

The quality of the Ridgewood water compares very favorably with that of any other water supply in the world. It has none of the hardness characteristic of the Croton, which flows over a primitive foundation, nor of the supplies of Troy and Newburgh, derived from a country where calcareous and aluminous minerals abound. This quality renders it more economical for domestic uses in the saving of soap and for manufacturing purposes, because it does not form any considerable incrustation in steam-boilers. Its inorganic impurities are of a sedimentary character, which settle to the bottom of the boiler in the form of fine mud, instead of forming a scale or incrustation, as would be the case were mineral impurities held to a greater extent in solution. It does not injuriously affect the health of the occasional visitor, as is frequently the case with the waters of neighboring cities. The soil through which it flows is composed of material almost entirely insoluble, and the complete aëration that it receives at the broad surfaces of the ponds and reservoirs, causes the precipitation of the greater part of the mineral impurities held in solution. The soluble inorganic matter consists of the carbonates of magnesia and of lime (the latter present to a greater extent in the Jamaica stream than in any of the others), chlorides of magnesium, calcium and sodium, sulphates of lime and magnesia, and

oxide of iron, the weight of the whole not exceeding $2\frac{3}{4}$ grains per gallon, or in about the proportion of one ounce in six barrels of water. For the sake of comparison, the analyses of the waters used in several cities are added, the numbers indicating the grains of solid matter per gallon: Brooklyn, 2.64; New York, 6.65; Philadelphia, 4.26; Boston, 3.57; Albany, 4.72; London, 28; Paris, 9.86.

This abstract gives a very clear and accurate history of all the details of any interest in connection with the Brooklyn Water-Works. The cost of construction under the original contract was \$4,625,000, and "the total bonded water debt of the city on the 1st day of January, 1876, as reported by the Comptroller, was \$10,815,000," so that they have cost, since their completion to date, \$6,190,000. The interest paid on the 1st of July, 1875, was \$328,913.33, and on the 1st of January, 1876, it was \$331,445.00, making the total interest for the past year amount to \$660,358.33. If we add that the interest paid on the 1st of January, 1875, was \$320,804.03, we see that it has been progressing steadily, and the principal must have progressed in the same ratio. "The expense of maintaining the water-works proper (including coal and other material on hand) for the past calendar year, aggregates \$343,729.97," and if we add the interest on the bonded debt for the same period, we have the expenditure for our water supply for the past year, \$1,004,088.30.

The receipts from Department	\$895,202.71
“ “ “ Registrar of Arrears, etc.	81,870.50

Receipts for the year \$977,073.25

This would leave a deficit for the year of \$27,015.05, were it not for a balance to the credit of the Board in the city treasury, on January 1st, 1875, of \$309,199.76.

THE REV. P. B. FISK, of Springfield, Vt., was taken with bleeding of the left lung, accompanied with violent pains, a few days ago, and, during a violent coughing spasm, expelled from his left lung a tooth, which he had swallowed two weeks before while under the influence of ether administered by a dentist.—*Evening Post.*

ON THE PROFESSION OF DENTAL SURGERY.

A Letter addressed to the Editor of the *Lancet*. By JOHN TOMES, ESQ., F.R.S.

SIR: The attempt to bring the influence of the medical profession to bear upon the training of Dental surgeons can be of advantage only when medical men are made fully acquainted with the scope and requirements of Dental surgery, an accurate knowledge of which they do not at present possess. The existence of special journals, while they render great service in bringing before the Dental practitioner all that relates to his calling, tends to remove from the eye of the general practitioner much that he well might know, and more that it is needful that he should know if he would form a just opinion of the present state of Dental surgery. The absolute necessity for a long special training in order to acquire moderate capabilities as a Dental practitioner is very generally overlooked, and the power to pass an examination in surgery and to write a prescription is accepted as a sufficient education for the Dental surgeon. But those whose powers constitute them efficient judges know full well that there is little difficulty in recognizing what is required in the treatment of a case, but very great difficulty in acquiring the power to carry it into effect. To take out a large portion of the softened tissue from a carious tooth and to fill up the hole with a plastic material requires little skill; but to remove the diseased part as fully as may be, to leave the cavity in a form capable of retaining a long-lasting plug, and to introduce that plug—in fact, to perform the operation up to the highest standard of excellence, without an undue expenditure of time exhaustive to the patient and operator—requires great skill, a degree of skill gained only by patient training over at least two years in pupils naturally not inapt. Let any one interested visit the Dental Hospital, and watch the performances of students of one year, then those of two years' training, and, if possible, the operations of the more skillful teachers, let him then try his own hand, and all I have stated will be admitted. That which is true respecting filling teeth applies also to other Dental operations. But the Dental surgeon will be occupied three-fourths of his time in treating carious teeth, and, if his operations are rightly performed, he will have rendered good service, and secured the lasting gratitude of his patients.

Were it otherwise we should find medical practitioners using the leisure hours of their early professional life in the performance of Dental operations. In truth, the education of the surgeon does not embrace

Dental surgery. A man may be a member of the College of Surgeons or Physicians or of the Apothecaries' Company, and yet know nothing of Dental surgery ; and it would be unreasonable, and, consequently, all but impossible, to impose upon him a long and expensive training in a specialty he is not specially destined to practice ; and, again, the knowledge acquired would be speedily lost unless constantly practiced. That which would be true of the general surgeon applies with equal force to the Dental surgeon, whose knowledge of general surgery fades from disuse by the time he acquired his general diploma ; for his specialty will, if rightly practiced, demand all his time and thoughts. He cannot remain an effective general surgeon if he would be a faithful Dental surgeon. He may be a legally qualified practitioner, but, without use, the knowledge he acquired up to the level of a pass examination will speedily waste, and he will become morally disqualified.

These facts were fully recognized twenty years ago, when the College of Surgeons instituted its department of Dental Surgery, laid down a curriculum to be followed by students, and after examination granted a diploma of fitness to practice, under the title of Licentiate in Dental Surgery. In this curriculum certain subjects embraced in the general medical education, but scarcely needful to the Dentist, such as midwifery, forensic medicine and botany, etc., were left out, and in their stead special Dental subjects were introduced, leaving the time and cost of the profession strictly unaltered. The wisdom of this course is shown in the fact that the Dental School formed to meet the requirements of the curriculum has from year to year increased the number of its students, who at the present time nearly approach one hundred ; and that the education meets the necessities of the Dental surgeon is proved by its voluntary acceptance by those whose purpose it is to follow Dental practice. For it must not be forgotten that the legal powers given to the colleges in the Dental charter are permissive only ; hence the education is offered, not enforced. The value of the diploma has been steadily advanced by extending the educational opportunities, by gradually increasing the strictness of the examination, and by the addition of written to the *viva voce* questions. And the preliminary examination in arts now required of the medical student before entering upon professional studies will also be required of the Dental student from October, 1877.

The licentiateship is the qualification needed by the Dental surgeon, for no other indicates that the possessor is practically acquainted with Dental surgery ; and surely, if we would gain our living by Dental

practice, we must before all else be skillful Dentists. I use the word *Dentist* because the public will call us Dentist do what we will, just as they call the ophthalmic surgeon an oculist; and if we suffer, it will not be by the name but by our want of worth.

I do not for one moment argue against the Dental student taking a general medical qualification; on the contrary, I would urge the student whose means and time will allow, to take the membership or fellowship of the College of Surgeons or Physicians, and I would further advise him to take the B. A. of one or other of our Universities. But I do protest against the student making a general qualification stand in the stead, and take the place, of the special one, if he proposes to gain his living by our specialty.

Dental surgery some years back suffered greatly from one or other of two conditions. The practitioner had at the outset only a general medical education, or in many cases he possessed no education at all, and the suffering is not yet at an end; but the wise course taken by the College of Surgeons has already very greatly reduced the evil, and will doubtless ere long, to the exclusion of the incompetent, provide the public with a very efficient race of practitioners.

It is reasonably hoped that the permissive education, the success of which no well-informed person can deny, will become compulsory, and that a distinctive line will be drawn between the competent and incompetent practitioner, recognizable by the public.

The membership and licentiateship jointly may be said to meet the case, but they involve a higher and more costly education than either taken singly, and it is not reasonable to expect that all Dental students will be prepared to meet the demand of the double qualification. For such, and they will probably form the majority, at least for some time to come, the licentiateship will suffice, as being the educational equivalent of the single qualification in the general practitioner.

There has been much loose talk about the status of the Dental practitioner. We had better work more and talk less upon the education of ourselves and our fellows: The Legislature can neither give nor withhold social status. The public will settle the question, and our position will be determined by our individual and collective professional and general culture, by our professional usefulness and scholarly attainments.

I remain, Sir, yours truly,

June 14th, 1876.

JOHN TOMES.

OUR POPULATION.

THE PEOPLE OF THE UNITED STATES ONE HUNDRED YEARS AGO AND NOW.

The first century of the United States closes to-day. It has been a century of development without parallel in history. The population has increased from 2,750,000 to 44,675,000. The area has been extended from 800,000 to 3,603,844 square miles. The development of agriculture under the pressure of immigration and the stimulus of mechanical invention has been utterly without precedent. The value of manufactures has advanced from \$20,000,000 to \$4,200,000,000. Foreign and domestic commerce has taken gigantic strides. The marvelous development of mineral resources has not been the work of a century, but of fifty years. There was not a single bank in the colonies in 1776; there are more than 6,000 now. Internal improvements and the common school-system have kept pace with immigration.

At the outbreak of the Revolution the Continental Congress ascertained approximately the population of the thirteen colonies, in order that the burdens of the war might not fall too heavily upon any section. The total population was estimated at 2,250,000, exclusive of 500,000 slaves at the South. In 1870 the nation which the representatives of these colonies founded was the fifth of the great empires of the world in respect to population, and it is now undoubtedly the fourth. The Chinese empire in 1870 had 477,500,000 inhabitants; the British Empire, 174,200,000; the Russian Empire, 76,500,000; the German Empire, 40,200,000; the United States, 38,558,731. The average increase in the aggregate population since 1870 in the fifteen states in which a census has been taken is 16 per cent., and at the same rate of increase the total population in 1875 would be 44,675,000, while that of the German Empire, according to the recent census, is 42,757,812. During sixty years (1800-60) the population of the United States increased 593 per cent., that of England and Wales, 121 per cent., and that of France, 37 per cent. The great factor of the marvelous growth of our population has been immigration. Annexation has contributed very little. The purchase of Louisiana, Florida, California and New Mexico brought in fewer than 150,000 inhabitants, and the acquisition of Texas and Oregon merely restored to citizenship those who had emigrated from the United States.

The colonies were founded in a religious age, under the best possible conditions for ultimate self-government. Nearly all the early settlers belonged to the industrious middle classes of the Old World. A substantial equality existed among the Puritans in New England, the Dutch in New York, the Quakers and Germans in Pennsylvania, the Swedes in New Jersey and Delaware, the English Roman Catholics in Maryland, the English Churchmen in Virginia, the Nonconformists in North Carolina, and the Huguenots in South Carolina. At the time of the English Revolution of 1688, settlements had been made in all the thirteen colonies except Georgia, and the total population was about 200,000. Growth was slow and unequal, and it was not until 1750 that the population exceeded 1,000,000. During the next twenty years the population of the colonies was doubled, and on the threshold of the Revolution there swept a great current of immigration from Germany and Ireland into Pennsylvania, New York and the Carolinas. The first census of the United States was taken in 1790. The result chilled the overwrought enthusiasm of Mr. Jefferson, and he took pains to caution his correspondents at foreign courts against accepting the figures, inasmuch as they fell short of what he thought was the truth. The population was 3,929,214, including 757,208 slaves. From 1790 to 1820 about 234,000 immigrants arrived. A great wave of immigration then swept across the Atlantic.

At the outset America was regarded as a refuge for oppressed labor. The immigrants were accustomed to the simplest forms of labor, and were ready to build canals, and subsequently railroads. The development of manufactures in New England changed the aspect of immigration, and foreigners came to regard the United States as a market for skilled labor. The cheap lands offered under the homestead bill attracted an immense number of industrious farmers. During twelve years an area greater than that of New England was occupied and tilled by 275,000 families under the operation of this act. Interstate migration has been from the first a popular instinct. There was a constant movement from the half-settled states to the unsettled territory, and those who were left behind manufactured for those who were on the frontiers. From 1845 to 1854 there was a great exodus from Ireland and Germany. After the famine of 1846 immigration from Ireland more than doubled, reaching its maximum in 1851. During this period nearly 1,500,000 Irishmen landed in Castle Garden. German immigration reached its highest point in 1854. After the years 1837, 1857, and 1873, there was a most remarkable decline in immigration,

a commercial revulsion acting as a wet blanket. The total number of immigrants from 1820 to 1873 was 8,808,141, of whom 2,907,565 were from Ireland, and 2,663,437 from Germany. About 60 per cent. (after deducting women and children) were in the prime of life; 46 per cent. were trained to various pursuits, and 10 per cent. were traders.

Nearly 10,000,000 of our population are foreigners, or the descendants of foreigners. It has been estimated that, if the fusion of elements were complete, of 100 drops of American blood, 25 would be Anglo-Saxon, 27 German, 2 Dutch or Scandinavian, 30½ Celtic, 2 Romanic, and 12½ uncertain. The white, red, black, and yellow races are all represented. In 1870 the ratio of the colored to the whole population was 14½ to 100. The rate of increase of the colored race during the decade was far behind that of the whole population. From 1853 to 1874 a small percentage of immigration has come from China. The total number of Chinamen who arrived during that period was 144,328. The total number of Indians in the United States in 1870 was 383,712, of whom 96,366 were on Government reservations. As regards sex, the population of the United States is nearly equally divided. The doctrine of the comparative sterility of the native population has been quite generally accepted on both sides of the Atlantic, but Dr. Edward Jarvis has recently demonstrated that it is a fallacy based on statistical blunders.

In 1790 one-thirtieth of the population was in cities, and there were only six towns whose population exceeded 8,000. In 1870 one-fifth of the population was municipal, and there were 374 incorporated cities. The growth of some of these cities has been marvelous. In ten years the population of Jersey City increased 179.7 per cent.; of San Francisco, 163.2, and of Chicago, 173.7. During the colonial period the principal occupations were husbandry, lumbering, trading, hunting and fishing. One-third of the labor of the country was employed in timber-cutting. According to the last census nearly 6,000,000 are engaged in agricultural pursuits, 1,200,000 in trade and transportation, 2,700,000 in manufacturing and mining, and 2,600,000 in professional life, and there are 43,000 clergymen, 40,000 lawyers, 62,000 physicians, 126,822 teachers, 2,000 actors, 5,200 journalists, 1,000,000 laborers, and 975,000 domestic servants. Alexander Hamilton's dream of the diversity of human industry in the New World has come to pass.—*New York Tribune*.

BOOKS AND PAMPHLETS RECEIVED.

Nos. 1 and 2 of vol. I. of MICRO-PHOTOGRAPHS IN HISTOLOGY, NORMAL AND PATHOLOGICAL. By Carl Seiler, M.D., in conjunction with J. Gibbons Hunt, M.D., and Joseph G. Richardson, M.D. Philadelphia: J. H. Coates & Co., Publishers, 822 Chestnut St.

This new monthly—to quote from its Prospectus—“is intended to replace the microscope, as far as is possible, for those physicians who have neither opportunity nor leisure to make observations with the instrument for themselves, and also to furnish microscopists, for comparison, correct representations of typical specimens in the domain of normal and pathological histology.

“As the pictures are obtained directly from the microscopic objects by means of photography, and printed from the negative by a reliable mechanical process, they have the great advantage of being faithful copies of the pictures formed by the lens, and there is nothing produced that is not actually visible in the instrument, thus avoiding the diagrammatic character and the subjective coloring which are so frequently found in drawings made by means of the camera lucida. In fact, the illustrations used in the lecture-room and found in books are idealized so much as rarely to give an exact impression of the specimen as it really exists.”

Each of the numbers sent us contain four “micro-photographs,” about four inches in diameter, and seem to be well executed. The subscription price is \$6 per year. Price per number, 60 cts.

NOTES.

Harvard University Commencement.

Boston, July 15th, 1876.

At the annual commencement of Harvard University, the following named graduates from the Dental School received the Degree of D.M.D., viz.:

Thomas Bradley, of Holyoke, Mass.; Oscar Berlin Brann, of Portland, Me.; George Peters Caldwell, M.D., of St.

John, N. B.; George Cunningham, B.L., B.Sc., Paris, of Edinburgh, Scotland; Edgar Morton Jewett, of Salem, Mass.; George Otis Lawrence, of Boston, Mass.; Jesse Robbins, of Salem, Mass.; Charles Claude Rogers, M.R.C.S., L.D.S., of London, England; Ezra Fletcher Taft, of Dedham, Mass.; Julius George William Werner, of Boston, Mass.

THOMAS H. CHANDLER, *Dean.*

Minnesota State Dental Association.

At the fifth annual session of the Minnesota State Dental Association, held at Minneapolis Wednesday and Thursday, May 31, and June 1, 1876, the following officers were chosen :

President, Dr. W. F. Lewis, Winona ; Vice-President, Dr. M. B. Patterson, St. Paul ; Secretary, Dr. C. M. Bailey, Minneapolis ; Treasurer, Dr. A. L. Bausman, Minneapolis.

By appointment of President: Committee on Membership—Dr. J. M. Williams, of Rochester, and Dr. Alfred Welch, of Winona.

Executive Committee—Dr. E. Griswold, of Minneapolis, and Dr. F. A. Williamson, of Red Wing.

Is Medicine a Science ?

It is a nice question, in many cases, which has done the more hurt, the disease or the remedy ; whether, for instance, the child's health suffers more from the intestinal parasites which vex him, or from the destructive purgatives employed as anthelmintics ; whether the cancer or the knife produces death more speedily ; whether calomel and quinine be not pretty much such friends to the sick man as La Fontaine's good-natured bear was to the gardener, whose mouth he crushed while trying to brush the flies off as he slept. It is an equally nice question to determine whether there ever really does occur a critical period in any disease, when the direct action of actual medicine, *per se*, can turn back the wavering life from the jaws of death to the flowery meads of re-established health, or, granting the possibility of such a rare occurrence, do we not run too great a risk, as a rule, to be able to profit by it ? These are nice questions, as I have called them, nor does the present condition of medicine entitle us to expect to see them answered. For these reasons, among many others, medicine cannot be called a science.

It must not be supposed, however, that the doctor's office is to become a sinecure because his drugs are voted rubbish and his methods false. On the contrary, we shall need him quite as much, and his advice will be more valuable to us than ever. He will not have it in his power to do harm, and consequently can give his undivided energies to the pursuit of good. It shall be his office to teach us the fallacy of physic. He shall present to our minds in all its horrid array the atrocious enormity of medicine as once it was practiced, and so shall save many a poor sufferer amongst us from unconscious suicide. He shall be our perpetual beacon-light against the iron-bound, immitigable load-stone rock of quackery, where so many fair keels lie untimely wrecked. In fine, he shall become to us the counterpart of that invaluable member of another profession known as the chamber-lawyer, a quiet man of skill and experience, who abounds with all the wisdom and unction of pertinent counsel, and who never takes his client into court, where he is bound to lose, no matter how his case is decided.—EDWARD SPENCER, in *The Atlantic for May*.

Nickel.

A vein of nickel has been discovered in New Caledonia, extending across the entire island, from east to west. There are also in New Caledonia copper mines of great richness. The gold mines, of which much was expected a few years ago, have so far yielded insignificant results.

Death-Rate.

The death-rate of some English towns is very high. Thus, while the death-rate for England and Wales generally is 22.2 per 1,000, in Bristol it is 26.9, in Leeds, 28.7, in Manchester, 32.1, and in Liverpool, 35.9. Of children under five years of age, 39 per 1,000 die annually in country districts, while in towns the ratio is 103 per 1,000.

JOHNSTON ADJUSTABLE FOUNTAIN SPITTOON.



The defects of the Fountain Spittoons hitherto made are, that it is almost impossible to keep them from leaking, and that they occupy a rigid position close to the left of the chair, and hence prevent the operator from working on that side.

These defects will not be found in this spittoon, which is commended to the favor of Dentists by the following points of merit :

1st. It is readily adjustable to the position of the chair ; that is, it can by an easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches away from the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way.

3d. Having no wooden case, twelve inches square, but in its stead only an ornamented metal tube less than one and a half inches in diameter, it will not warp, and it occupies very little room.

4th. Its movable joints are so arranged that any leakage, if it should occur, is caught and conveyed into the waste pipes.

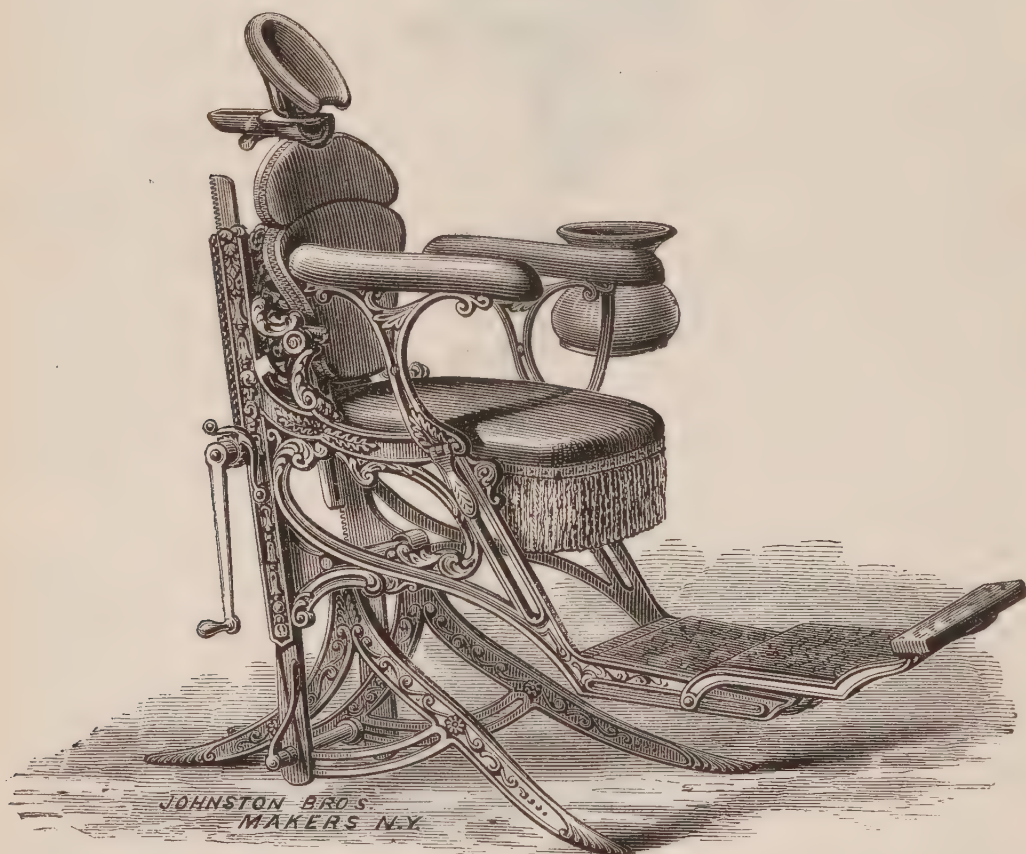
5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

6th. All its bright parts are of gun metal, and its tubing silk covered.

Price	\$60.00
Boxing	2.00

JOHNSTON BROTHERS, 812 Broadway, N. Y.

THE MORRISON DENTAL CHAIR.



Price \$150.00, or, with Castors, \$160.00. Boxing, \$5.00.

Spittoon Attachment, \$8.00.

WITH JOHNSTON'S NEW HEAD-REST, \$8.00 EXTRA.

It possesses great superiority over any chair before offered to the profession, and is at the same time less expensive than any other first-class chair. Some of its points of superiority we here enumerate :

- 1st. All the advantages of any low-based chair, and also of any high-based chair, are here secured in a single chair. In it the patient can be placed lower than in the lowest-based chair made, or higher than in any other of which we have knowledge. At its lowest position the seat is fifteen inches, and at its highest position forty-two inches above the floor.
- 2d. The operator using the Morrison Chair can either stand or sit at his work, as he may choose, working with equal convenience in either position.
- 3d. It has been a very general complaint that dental chairs are too wide at the back, so holding the operator away from his work. Here this difficulty is overcome. The chair is narrow at the back, so that the operator need not stretch to reach the patient, but *can lower either arm of the chair out of the way* and so be as near the patient as he may choose.
- 4th. It can be changed from its lowest to its highest position in seven seconds — a celerity impossible in any chair raised by a screw.

- 5th. It can be very readily and perfectly adapted to operations on children of any age
First. Because in it the child can be raised as high as needed for the tallest operator.
Second. It provides a comfortable back and head rest, exactly as for grown persons.
Third. The footstool can be lengthened or shortened, to suit children of any size.
- 6th. The back of the chair can be lengthened or shortened rapidly and at will.
- 7th. The lower part of the back can be thrown forward to support the small of the patient's back.
- 8th. The chair, when adjusted to any position, is firm or steady wherever placed, and this is *especially true of the head-rest.*
- 9th. It occupies less room than any other operating chair.
- 10th. Although the footstool, when at its extreme length, is much longer than any other made, yet a person of ordinary weight can stand on its extremity without tipping the chair.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

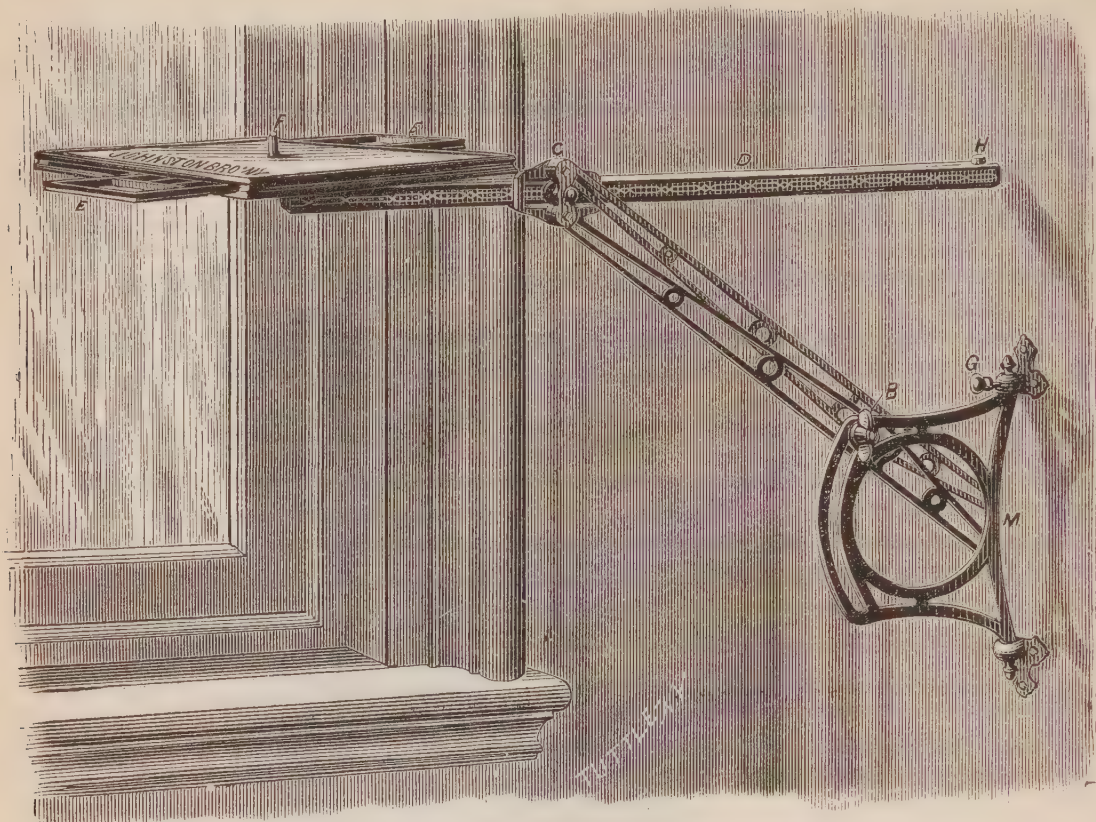
We venture to append the names of some of those who have used the Morrison Chair. As the list of purchasers is too long for publication here, we name a few only from each section of the country.

O. A. JARVIS, *New York.*
D. H. GOODWILLIE, *New York.*
• O. A. HOUGHTON, *Brooklyn, N. Y.*
A. C. HAWES, *New York.*
W. B. CHAMBERS, *Newark, O.*
C. B. ANSART, *Oil City, Pa.*
M. H. WEBB, *Lancaster, Pa.*
T. W. FRENCH, *Gt. Barrington, Mass.*
E. H. EVANS, *Rockland, Me.*
E. O. SMITH, *Salem, Oregon.*
W. F. LEWIS, *Winona, Minn.*
T. J. McMILLAIN, *Paris, Ky.*
G. W. TINDALL, *Kansas City, Mo.*
A. W. KINGSLEY, *Elizabeth, N. J.*
J. N. SCRANTON, *Bennington, Vt.*
O. A. GLIDDEN, *New York.*

JAMES McMANUS, *Hartford, Conn.*
R. F. BORDEN, *Red Bank, N. J.*
F. A. SHAILER, *Essex, Conn.*
WILLIAM DUTCH, *San Francisco, Cal.*
R. B. DONALDSON, *Washington, D. C.*
B. F. COY, *Baltimore, Md.*
C. P. CLIFFORD, *Lowell, Mass.*
S. H. HINKEL, *Stannton, Va.*
E. G. WHEELER, *Mobile, Ala.*
J. A. DAVIS, *Chicago, Ill.*
C. B. ERICHSON, *New Britain, Conn.*
H. BENTLEY, *West Meriden, Conn.*
H. H. SAYLES, *Elmira, N. Y.*
PRESTON DAY, *Warren, R. I.*
E. T. DARBY, *Philadelphia, Pa.*
G. W. TRIPP, *Auburn, N. Y.*

H. B. SANDS, M.D., Surgeon, *New York*

MORRISON DENTAL BRACKET



PRICES.

With Black Walnut Table, 12 inches square.....	\$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather.....	40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket.....	17.00.
Boxing.....	\$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these :

- 1st. It combines a greater variety of range and movement than any other.
- 2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
- 3d. It provides a clean receptacle for foil and instruments.
- 4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
- 5th. Its drawers extend through the table and can be opened from either side.
- 6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

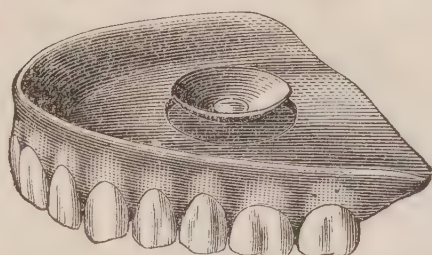
\$25 Worth of Engine Instruments,

TEN PER CENT. DISCOUNT.

1st. We repeat our notice of a special discount on all orders with cash, for Engine Burs, plain or stoned, Burnishers, Disks, Corundum, Arkansas and Hindostan Stones, etc., when amounting to twenty-five dollars or more. These are our "Universal" Instruments, and will fit either the Morrison, Suspension or S. S. White Engine. Order the Instruments by number, stating whether the numbers are from our Bur List or are those of another maker. All these Instruments are of the best quality, both in material and workmanship.

2d. All orders of less amount **accompanied with cash**, sent us for Instruments for Dental Engines, will be sent free of cost to the purchaser, by mail, if he so directs.

NEW PATENT ATMOSPHERIC DISK.



FOR HOLDING ARTIFICIAL TEETH FIRMLY IN PLACE

In Eating, Talking, Laughing, Singing, Coughing or Sneezing.

The undersigned offers to the dental profession this new and valuable device for retaining base plates securely in the mouth. Its utility has been demonstrated in over five hundred cases in my own practice. I believe it must come into general use, as no patient will dispense with it after a trial of its advantages. The Patent bears date of January 24, 1871, with seventeen years to run. Office, Town, County, or State rights for sale. Those desiring to test the disks practically before purchasing, can secure the necessary materials, ready for use, for six cases, with full instructions, by sending P. O. Money Order for three dollars.

Office rights for the full term.....	\$40 00
“ “ “ one year	10 00

Those purchasing rights for one year will be given rights for the balance of the term for \$30 more, if they choose to continue after the year has expired.

N. B. The Relyea Retainer and all other styles of disks are infringements of our patent; we shall certainly protect our rights.

Address

DR. QUINCY A. SCOTT,

Lock Box 1,015, Pittsburgh, Pa.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or "chattering" which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

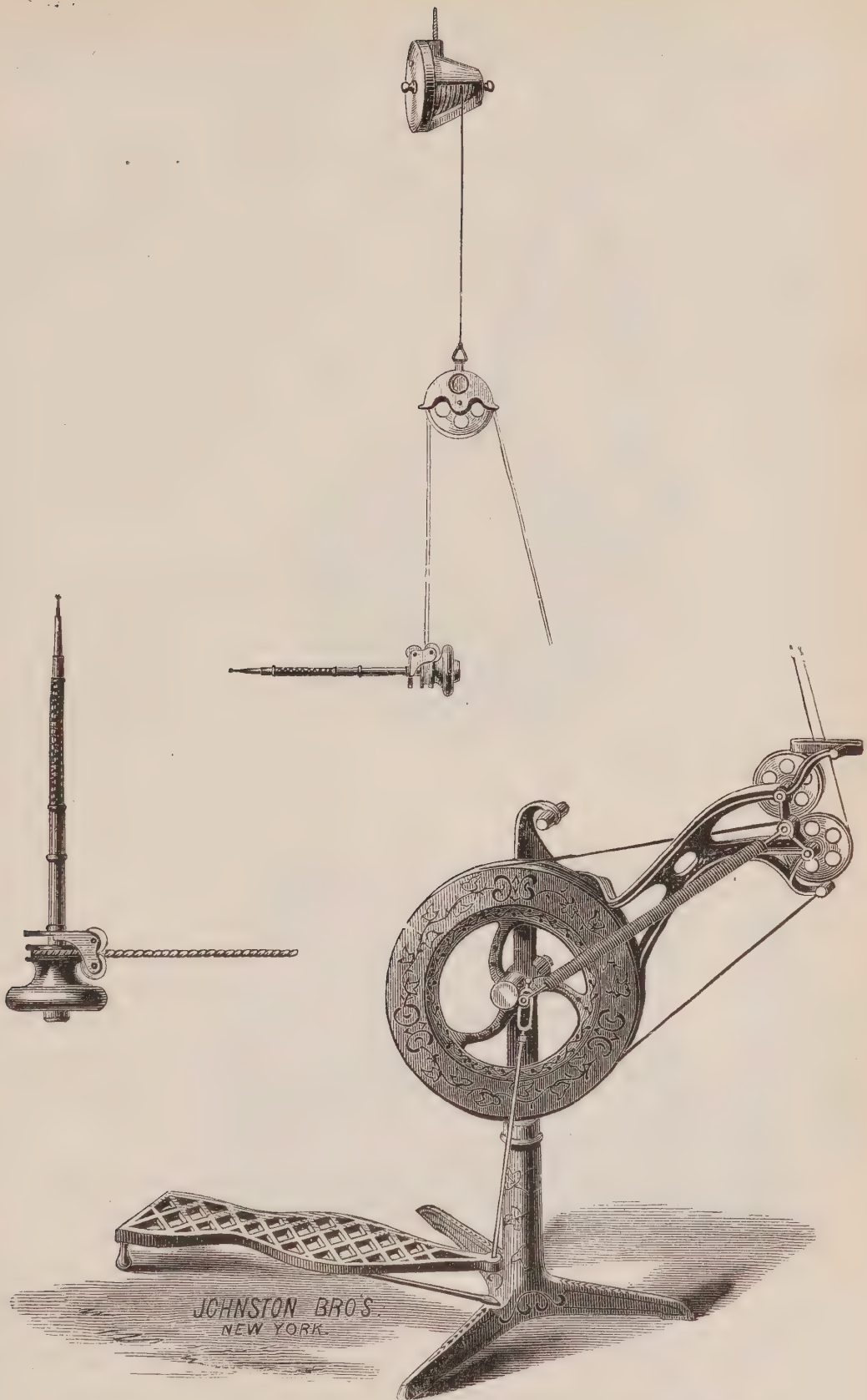
4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a "*light running*" Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROTHERS, 812 Broadway, N. Y.



SUSPENSION DENTAL ENGINE.

(DR. ELLIOTT'S INVENTION.)

Price, \$50.00. Right Angle Attachment, \$5.00. Boxing, \$1.00.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($\text{NO}^2 + 2\text{O} = \text{NO}^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid Nitrous Oxide*, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether	I	death to 23,204 administrations.	
Chloroform	I	" 2,723	"
Mixed Chloroform and Ether	I	" 5,588	"
Bi-chloride of Methylene	I	" 7,000	"
NITROUS OXIDE		no Deaths in 75,000	"

Edward R. Squibb, M.D., than whom our country has no more able pharmacist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

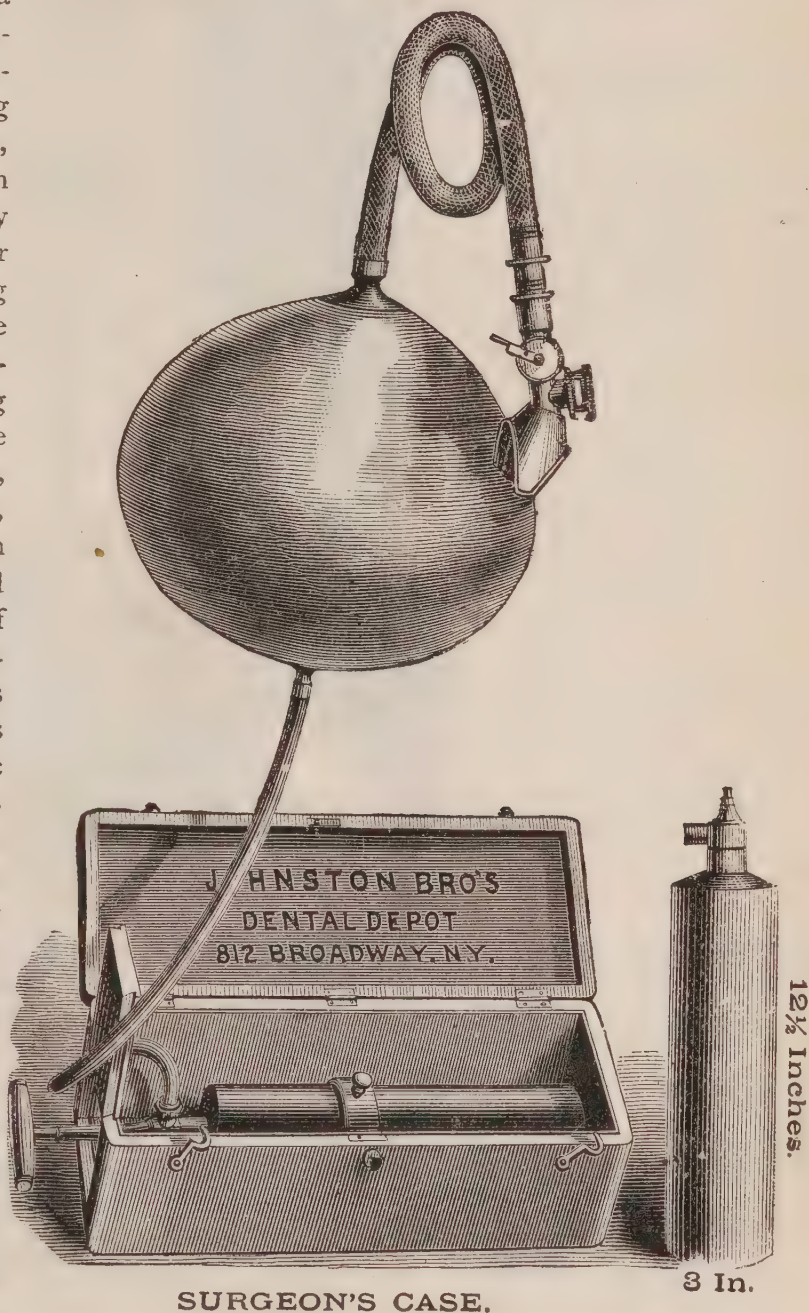
Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers

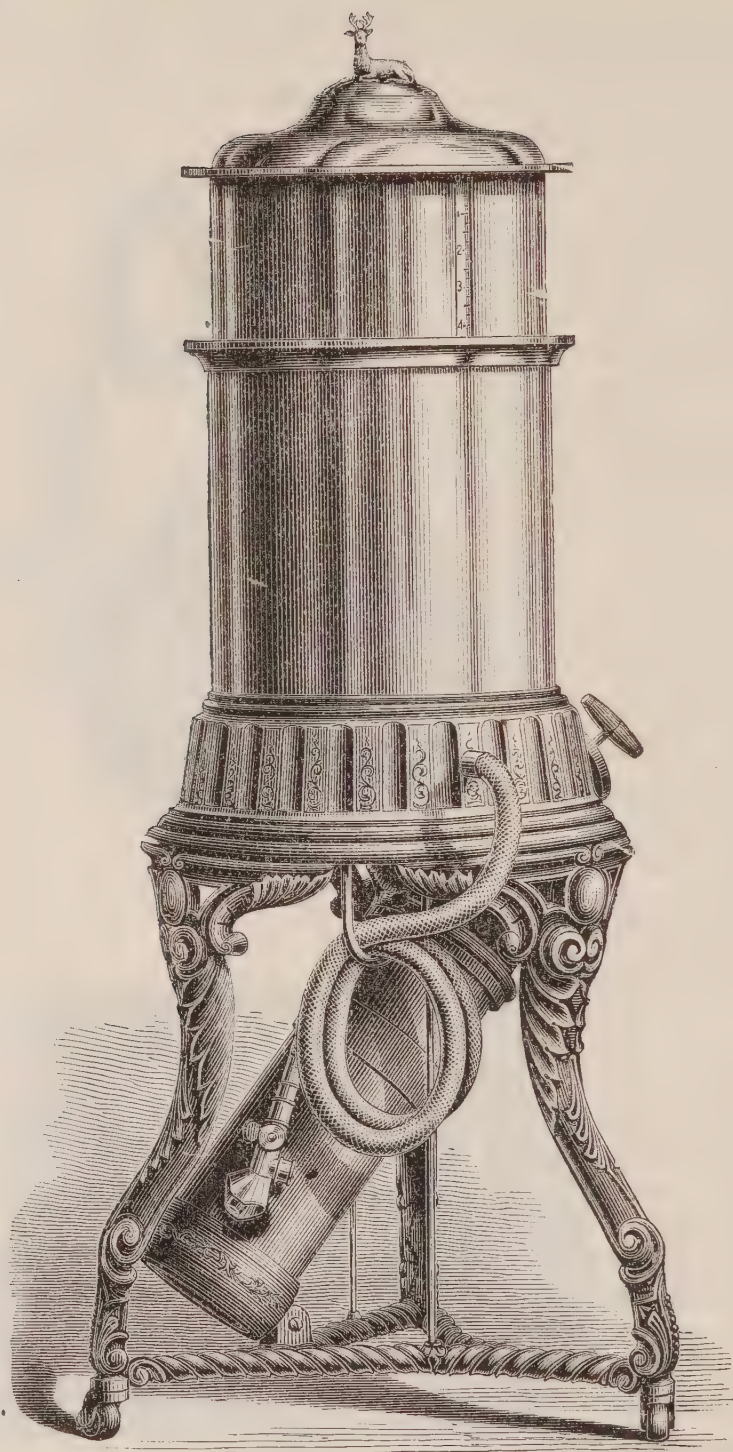
without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.

3 In.

12 1/2 Inches.



NICKEL-PLATED GASOMETER
AND ORNAMENTED STAND
FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas—this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality*.

JOHNSTON BROS., 812 Broadway, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler.....**No. 1**....\$42 00

Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic Inhaler.....**No. 2**.... 45 00

Boxing either, \$1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas..... 16 00

Refilling Cylinder..... 6 00

Nickel-Plated Gasometer, with ornamented iron stand..... 128 00

Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered Tubing)..... 12 00

1000 Gallon Cylinder..... 36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of 4½ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at 4½ cents..... 45 00

Morocco covered case, with ring and thumb screw, velvet lined..... 12 00

Polished bl'k walnut “ “ “ “ “ “..... 13 00

Or these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity) 5 00

Rubber Bag, with covered inhaler tubing, extra size..... 7 00

Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection..... 9 50

Key, Nickel Plated..... 1 50

Wrench, “ “..... 50

Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag..... 1 50

Covered Inhaler Tubing, per foot..... 50

Plated Connection to fit old style Inhaler..... 1 00

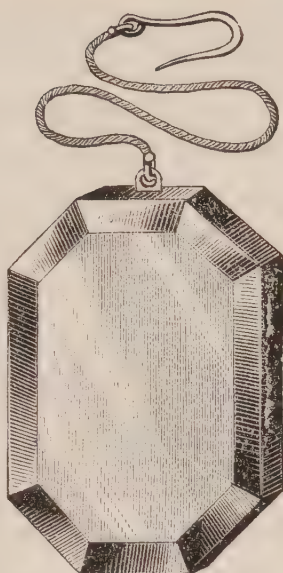
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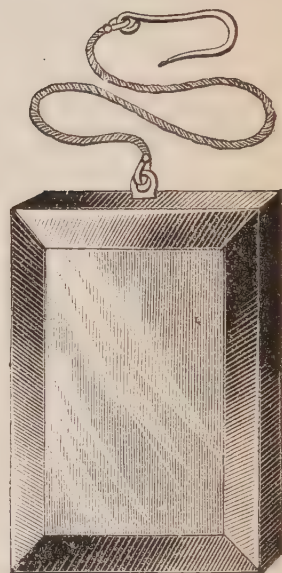
RUBBER DAM WEIGHTS.



No. 1.— $1\frac{1}{4}$ Oz.



No. 2.— $2\frac{1}{4}$ Oz.



No. 3.— $2\frac{1}{2}$ Oz.

These are made of metal, and are nickel plated. They are a decided convenience to one using rubber dam—as by attaching them to the free edges of the rubber, these edges are kept out of the way of the operator and from annoying the patient.

Price, single.....40 cents; per set, \$1.00.

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RUBBER DAM.

Invention of Dr. S. C. BARNUM.

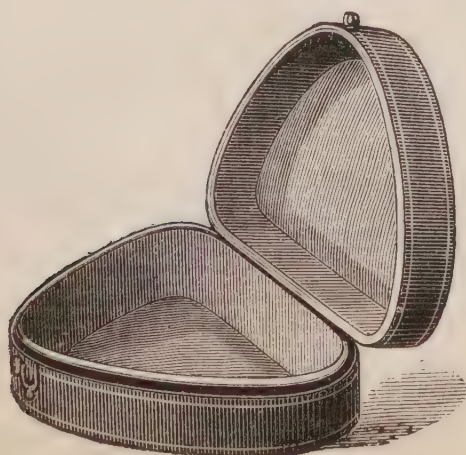
We constantly keep in stock an excellent quality of this article, now a necessity in Dental practice. This we offer in large or small quantity.

PRICES:—Thin, per yard.....\$2.50. n
Medium, per yard,.....3.00. n
Thick, “ “3.50. n

A liberal discount to the trade.

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Morocco, half oval, lined with cotton velvet, each.....\$ 35
Morocco, half oval, lined with cotton velvet, per dozen..... 3 60
Morocco, half oval, brass hinges and silk lined top, each..... 60
Morocco, half oval, brass hinges and silk lined top, each per dozen.... 6 00

JOHNSTON BROS.,
812 Broadway, N. Y.

SMITH'S OXYCHLORIDE OF ZINC,

Put up in ounce packages, in MOROCCO CASES, neatly lined with velvet, containing

FIVE GLASS STOPPERED BOTTLES.

The Center Bottle **LIQUID.**

THE POWDER IN FOUR COLORS, IN 1-4 OZ. BOTTLES.

With these Colors any desired shade can be obtained.

Each Case Contains a DROP TUBE.

Price per Package, \$4.00.

The above is also put up as heretofore, in one oz. Glass Stoppered Bottles, with DROP TUBE. Price per package, \$1.00. Prepared by

DR. J. H. SMITH.

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CHEMICALLY PURE TIN FOIL. NO. 1. 1000 Fine.

We are making an excellent quality of this foil, of numbers 4, 6, 8 and 10 (grains per sheet), and will make any higher numbers when ordered in lots of twenty books per number.

Price, per book.....75 cents.

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CHEMICALLY PREPARED MERCURY.

$\frac{1}{4}$ lb. Bottles, each.....70 cents.

JOHNSTON BROTHERS.

TOWNSEND'S AMALGAM.

Ounce packages.....\$2.00

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DENTAL PLASTER.

Our experience leads us to believe this fully equal to any offered for dental purposes.

Barrels.....\$4.50

Half Barrels.....3.00

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Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions...	\$150.00
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Dental Department.

BOSTON, MASS. 1875-76.

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GEORGE F. GRANT, D.M.D., Demonstrator of Mechanical Dentistry.

The Ninth year of this School begins on the 28th of September and continues till the last Wednesday in June. The distinction of Summer and Winter sessions being hereafter abolished. It will be divided into two equal terms, with a recess of one week at Christmas. The course of instruction will be progressive, extending over two years, the lectures of one year not being repeated in the next.

The regular examinations will be held in the following order, viz.: At the end of the first year, anatomy, including dissection, physiology and general chemistry. A certificate from the demonstrator of anatomy will be required of each student, that he has satisfactorily dissected the three parts of the body.

At the end of the second year, dental pathology, including a knowledge of gestation and diseases of women so far as they affect the mouth and throat, dental materia medica and therapeutics, oral surgery and surgical pathology, operative and mechanical dentistry. The examinations in operative and mechanical dentistry will include actual operations and the preparation of specimens of mechanical dentistry.

Every candidate must be twenty-one years of age, and of good moral character; he must give evidence of having studied medicine or dentistry three full years; he must have spent at least one continuous year at this school, have presented a satisfactory thesis and have passed all the required examinations.

The University Degree, D.M.D. (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfil the requirements.

Students may be admitted to advanced standing upon passing a satisfactory examination in a majority of the studies already pursued by the class; but no student shall advance with his class or be admitted to advance standing until he has passed such examination.

The work in the operative and mechanical infirmaries will go on throughout the course, but no student shall be permitted to operate at the chair until he has by observation and practice on extracted teeth satisfied the Professor of his fitness.

The faculty recommend young men who propose to take the degree to spend the whole of the required term of three years of study in the school. But those who wish to spend but two of the three years in the school are earnestly advised to pass their first year of study, before entering, under the direction of a *competent* private instructor.

Unsurpassed facilities for operative and mechanical practice are furnished by the infirmary of the Massachusetts General Hospital which is open throughout the year.

F E E S.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is \$200; for the second year, \$150; for any subsequent year, \$50.

For further information address,

THOS. H. CHANDLER, Dean,

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PHILADELPHIA DENTAL COLLEGE,

Nos. 108 and 110 N. Tenth Street, above Arch.

FOURTEENTH ANNUAL SESSION, '76-'77.



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J. FRANKLIN WARDWELL, Assistant Demonstrator.

THE DISPENSARY and Laboratory open all the year.

Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June. *Fall Preliminary Lectures*, commencing Monday, September 4th, will continue daily until November. Like the Spring Course, their object will be to anticipate subjects presented during the Winter Session. *The Regular Winter Course* commences Monday, November 6th, and closes on the last day of February ensuing. Three hours of each day will be devoted to attendance upon lectures, which will be illustrated to the fullest extent by a large and valuable collection of Chemical and Philosophical apparatus, and Anatomical and Pathological specimens. Tickets for the Course, including the Demonstrators', \$100; Diploma, \$30; Matriculation (paid but once), \$5. For further particulars address

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THE
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HENRY S. CHASE, M. D., D. D. S., Editor.

VOLUME VIII.

The Publishers of the Journal, being desirous of extending its circulation to the fullest possible extent, will send specimen copies to any part of the world on receipt of the address of dentists wishing to examine it. Address

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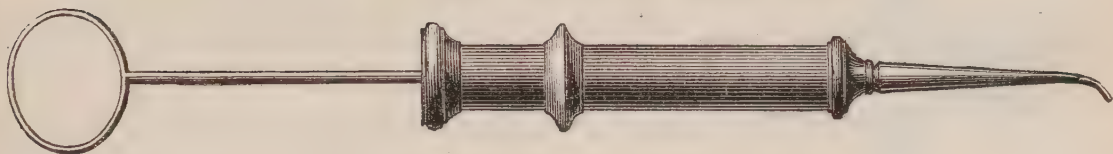
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DENTAL DEPOT.

Send for New Illustrated Catalogue.

SYRINGE.



This syringe, of metal, nickel-plated, is represented half-size. It is provided with a spring, a suggestion from Dr. A. H. Brockway, so that if after use it is placed in water its piston rises and it fills itself with water, and is so constantly ready for use.

The points, straight and curved, are removable at will.

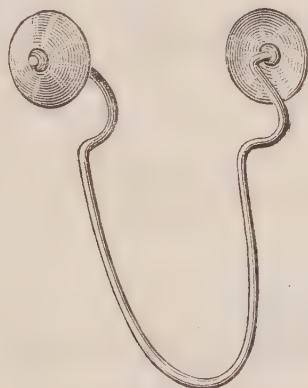
PRICES.

With one point, curved.....	\$2 25
With two points, one straight and one curved.....	2 50

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Elliott's Cheek Distender.



Cut is $\frac{1}{4}$ size.

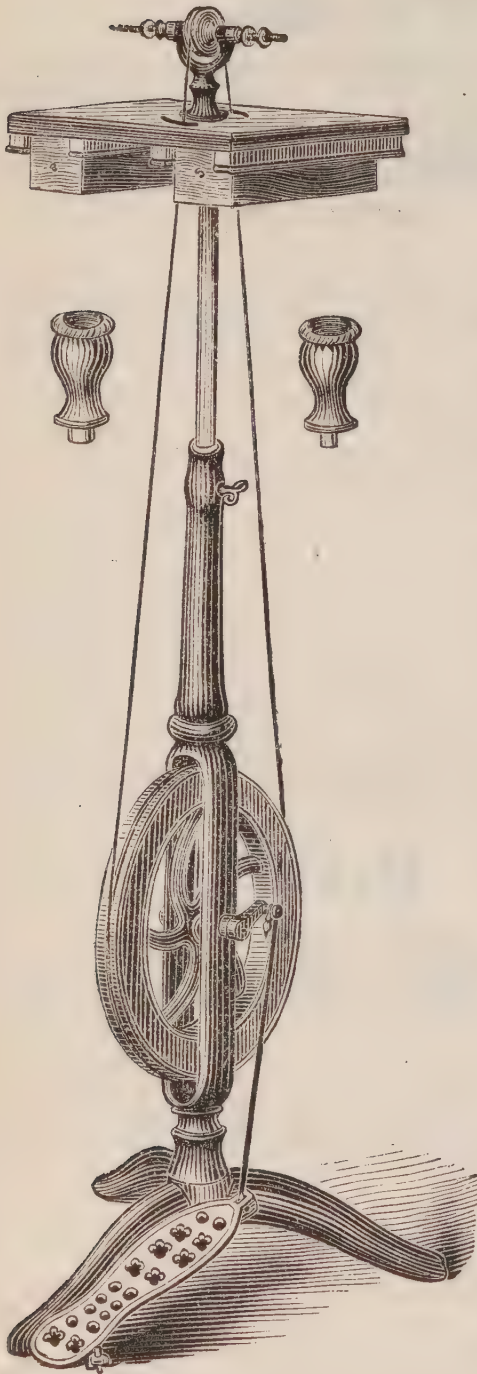
This convenient device, as its name implies, is designed to distend the cheeks of a patient during operations on the teeth.

Its bow of spring wire, and the cheek pieces are polished and nickel plated. It serves, in connection with its principal use, to reflect light on the teeth. As the spring is not stiff it is worn with very slight inconvenience. *This is proving extremely popular.* Price \$1.00.

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American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

Price of Lathe, with two Chucks, - - - \$18 00

“ Chucks, extra, - - - 15

 No charge for Boxing.

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WHALEBONE RUBBER.

Of this Rubber, the manufacturer states that it contains more than *double* the amount of gum to the pound than does any other dental rubber; that it will take and retain a higher polish; and that one pound of it will make eight sets of teeth more than one pound of any other rubber—it being so much lighter in proportion to bulk. Plates made of this rubber are so thin and springy that they will not rock or tip during mastication.

It is made from the most carefully selected materials, and will vulcanize in 55 minutes at 320 degrees Fahrenheit.

For lightness, elasticity, strength and polish, it is fully guaranteed to be the best in market.

Dentists supplied at all times, in large or small quantities.

Price, per pound.....\$3.50.

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HOUGHTON'S OS-ARTIFICIAL.

IMPROVED.

ITS SUPERIOR QUALITIES ARE

Extreme Toughness,

Strength,

Flint-like Hardness,

and Insolubility after Hardening.

Put up in glass stoppered bottles containing nearly ONE-HALF OUNCE.

Price \$1.00. Sent by mail.

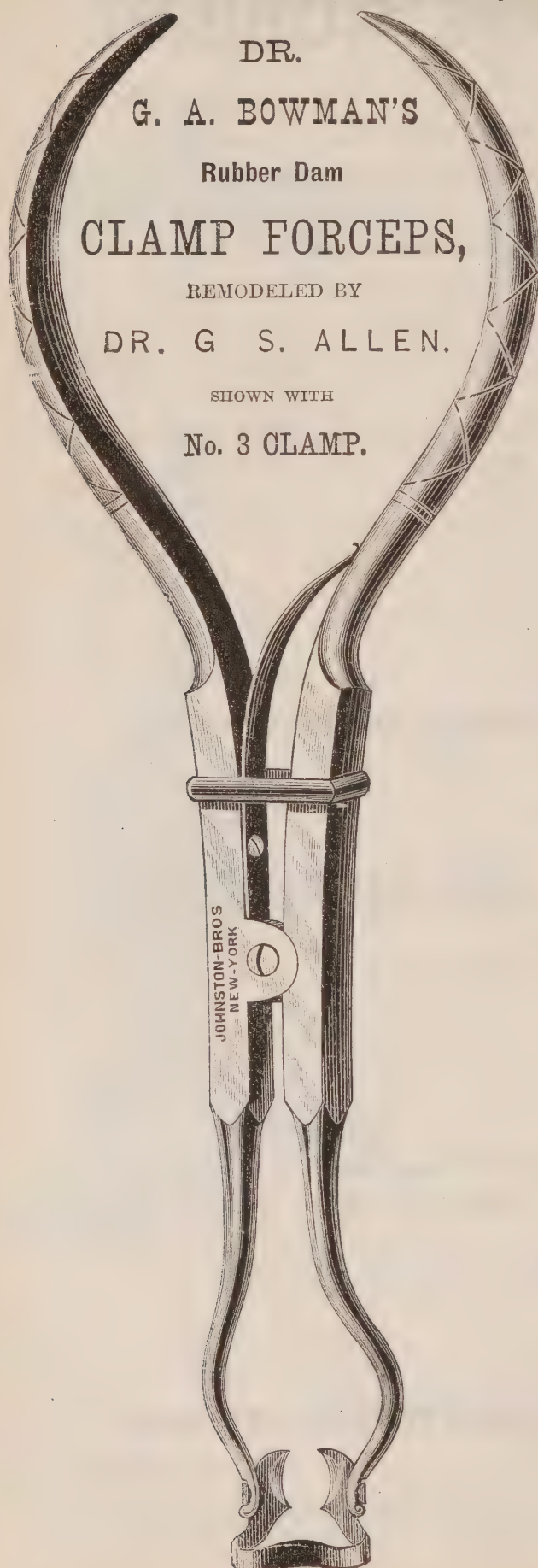
For Sale in any quantity by

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RUBBER DAM CLAMP FORCEPS.

Of these we offer two styles, both deservedly popular.



POINTS OF DR. T. C. ROYCE'S Rubber Dam Clamp Forceps.

Shown with Clamp. Handles are exactly like the other style, (Bowman's.)

Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

If so ordered we can supply either style of Forceps with a band, which will keep the Forceps and Clamp extended and ready for use when the hand of the operator is removed, as shown on the Bowman Forceps.

PRICES.

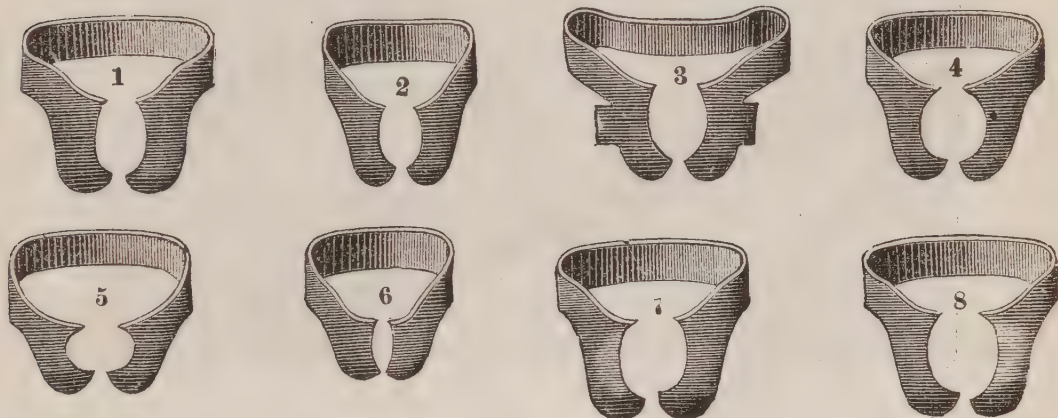
Forceps, either style	\$3.00
“ “ “ Nickel Plated....	3.50
Complete set of Clamps, embracing eight forms.....	4.00
Complete set of Clamps, embracing eight forms, plated.....	4.80
Clamps, each.....	.50
“ plated.....	.60

JOHNSTON BROS.

We were never more sure of doing signal service to the
Dental Profession than now in offering the

IMPROVED Rubber Dam Clamps,

INVENTION OF
DR. DELOS PALMER, OF NEW YORK.



• Price, set of Eight, { Oil finish, \$4.00. Each plain, 50 Cents
Nickel plated, 4.80. " Nickeled, 60

For use with Rubber Dam Clamp Forceps.

These Clamps are designed to be placed on the tooth at the commencement of the operation. Afterwards apply the Rubber Dam by passing it over both tooth and clamp.

DESCRIPTION.

Nos. 1 and 2.—Universal Clamp for Molars.

No. 3.—For posterior cavities in molars standing alone.

No. 4.—For third molars, or any molar of a cone shape. This Clamp can oftentimes be turned around while on the tooth, so as to place the bow of the Clamp out of the way of the operator.

No. 5.—For bicuspid.

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Nos. 7 and 8.—RIGHTS AND LEFTS.—For cavities under the gum, on the buccal or lingual surface of molars.

Cuts of two favorite styles of Rubber Dam Clamp Forceps will be found on another page.

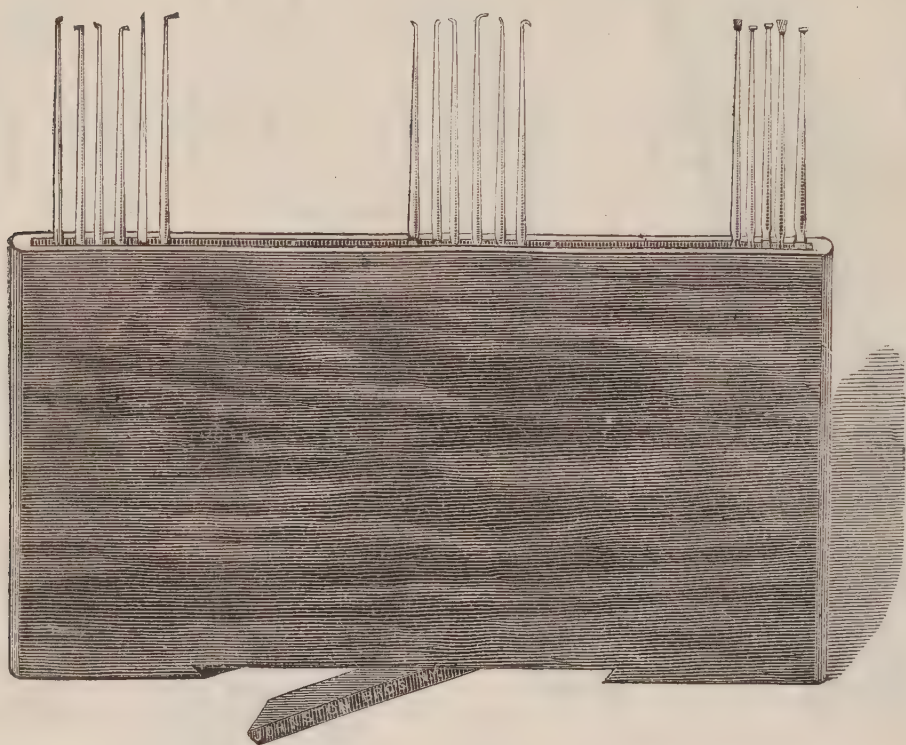
These Clamps have prominent points of marked superiority over those of other manufacturers.

First. Each has been carefully adapted to the shape of the tooth for which it is designed, *under the personal supervision of Dr. Delos Palmer*, the inventor.

Second. A groove is made by us in the clamp, into which the forceps nicely fit, so that the clamps firmly hold their position on the forceps, when once adjusted, instead of tilting from one position to another—as is the case when no groove is provided.

JOHNSTON BROS.

Fitch's Instrument Stand.



Both time and money are saved by any arrangement by which a dentist's tools are so distributed that he can at a glance recognize, and conveniently lay hold of any desired point.

It is a further convenience, if, when night comes, he may lay them in his drawer secure from dust without disarranging them. Dr. Fitch, of Lee, Mass., has designed an instrument stand for hand tools which combines these advantages. When placed on the table for use it is firm in its upright position, and the point of each instrument in it is distinctly presented to view. When its foot is closed into its base it is but 5-8 of an inch thick, and can be laid flat in any drawer without disturbing the instruments.

We make two sizes—No. 1, for excavating burs, &c., having 3-16 inch handles ; No. 2, for pluggers, &c., having 3-8 inch handles.

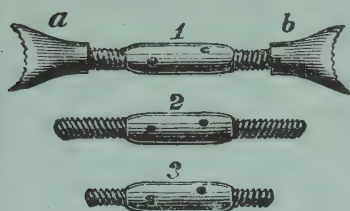
Price of each.....\$1.50

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Devised by Dr. C. S. LONGSTREET,
with Dr. A. McCOLLOM's Im-
proved Head.



This device is greatly prized by
those who have used it.

PRICES.

Full Set, as above, Nickel Plated,
screw and two extra bars..\$2.50

Jack Screw, Nickel Plated.....1.50

Bars, " " 50

Improved Triplex Rubber-Dam Punch.

Devised by Dr. F. W. DOLBEARE.

TWO STYLES, Nos. 1 and 2.



1st. It has in convenient
form for use three sizes of
punches.

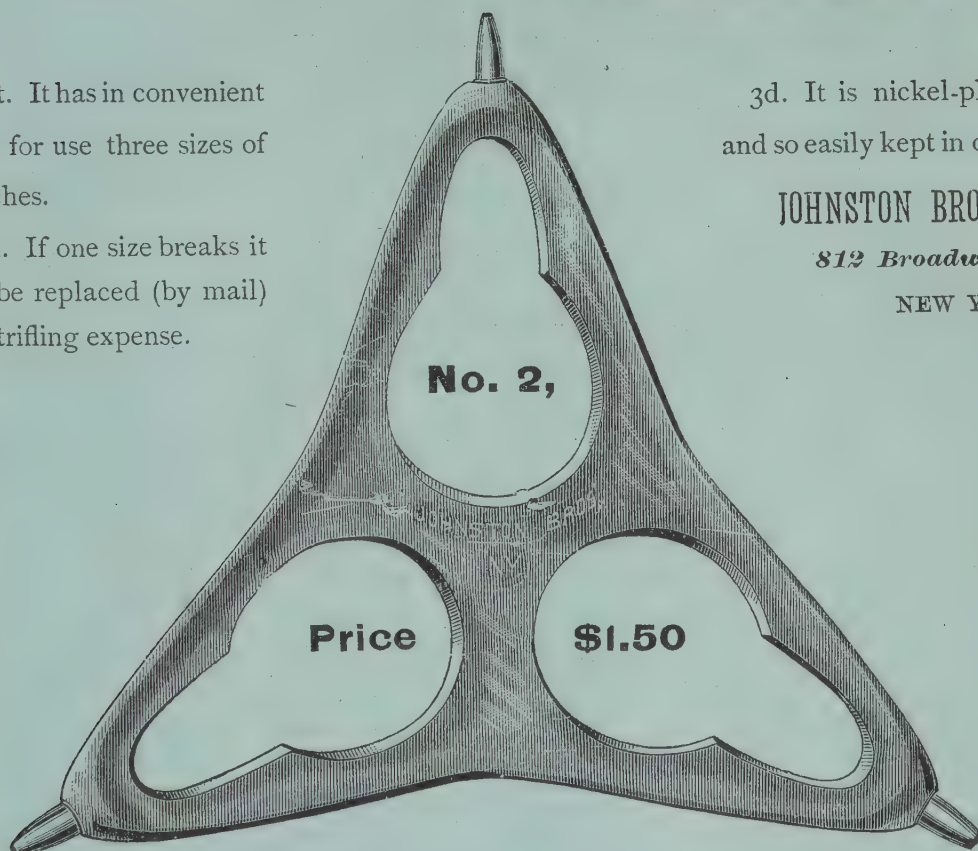
2d. If one size breaks it
can be replaced (by mail)
at a trifling expense.

3d. It is nickel-plated,
and so easily kept in order.

JOHNSTON BROS.,

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Dentists who have supplied themselves with the Morrison Chair, frequently request us to sell the chairs previously used by them. We therefore can ordinarily supply, at cheap rates, second-hand chairs of any of the varieties hitherto most used. For particulars, address

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—1876—

JOHNSTONS' Dental Miscellany,

A NEW MONTHLY JOURNAL

OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

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It will contain Prize Essays upon the important improvements of the day.

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2d. By the further reproduction of engravings upon dental subjects. Three such have already appeared, and others are in course of preparation.

3d. By the constant search for, and publication of items of office practice, which serve to show the methods adopted by eminent and experienced dentists to overcome the little perplexities of every-day practice, and to shorten the operations in both laboratory and operating room.

In short, it shall be the constant effort of the editor and publishers to make the Dental Miscellany of practical value to every actively employed dentist, as well as a source of literary enjoyment to its scientific readers.

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VOL. 3.

No. 33.

Johnstons' Dental Miscellany,

A MONTHLY JOURNAL OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

SEPTEMBER, 1876.

NEW YORK :
JOHNSTON BROTHERS,
812 BROADWAY.

JOHNSTONS'

DENTAL MISCELLANY,

FOR 1875.

It is certainly reasonable cause of self-congratulation on the part of the publishers of this Journal, that the end of the first year of its publication finds it with a large and constantly increasing list of subscribers, and that they are constantly in receipt of letters of encouragement and commendation from their readers in every section of the country, and even from distant portions of the world, one such letter being recently received from Japan.

We are promised one or more articles from each of the following gentlemen of established reputation, and others of like standing in the profession have encouraged the expectation of like favors from them.

Dr. A. L. NORTHROP, New York.
 Dr. WM. H. ALLEN, New York.
 Dr. J. B. MORRISON, St. Louis.
 Dr. W. C. BENNETT, New York.
 Dr. A. H. BROCKWAY, New York.
 Dr. D. H. GOODWILLIE, New York.
 Dr. W. A. BRONSON, New York.
 Dr. J. B. RICH, New York.
 Dr. THOS. BURGE, New York.
 Dr. FRANK ABBOTT, New York.
 Dr. E. A. BOGUE, New York.
 Dr. G. S. ALLEN, New York.
 Dr. W. S. ELLIOTT, Goshen, N. Y.

Dr. JOHN ALLEN, New York.
 Dr. W. GEO. BEERS, Montreal, Canada.
 Dr. C. BREWSTER, Montreal, Canada.
 Dr. C. E. FRANCIS, New York.
 Dr. W. JARVIE, Brooklyn.
 Dr. E. MAYNARD, New York.
 Dr. B. F. COY, Baltimore, Md.
 Dr. NORMAN W. KINGSLEY, N. Y.
 Dr. WM. CARR, New York.
 Dr. N. W. HAWES, Boston.
 Dr. L. C. WASSON, Ottawa, Kansas.
 Dr. W. H. DWINELLE, New York.
 Dr. A. C. CASTLE, New York.

Dr. T. H. CHANDLER, Boston.

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JOHNSTONS'

Dental Miscellany.

VOL. III.—SEPTEMBER, 1876.—No. 33.

AMALGAM MERCURY—ITS USE AND ABUSE.*

By A. C. CASTLE, M.D., New York.

FIRST GRAVE-DIGGER. What is he that builds stronger than either the mason, the shipwright or a carpenter?

SECOND GRAVE-DIGGER. Marry, now I can tell.

FIRST GRAVE-DIGGER. To't.

SECOND GRAVE-DIGGER. Mass, I cannot tell.

FIRST GRAVE-DIGGER. Cudgel thy brains no longer—

. *Shakspeare.*

For sometime past the mind of the dental profession appears to have been much exercised in relation to amalgam used as a succedaneum for filling and repairing teeth in a state of decay. The reviving this old, worn out subject was effected by Mr. Thomas Fletcher, of England, through the medium of American dental periodicals, by introducing his original proposition—now three years ago—intended to demonstrate the *shrinking* properties or characteristic in this respect of amalgam when tested in glass tubes, therewith

Setting each M.D., M.D.S. and D.D.S.

To packing amalgam in barometric glass;

and concluding, a short time since, with an additional proffered consideration or conundrum in its “bearing upon,” or connection with amalgam, under the title of “Mercury—its Uses and Abuses,” published in the columns of a Western dental periodical as having been read May, 1876, before the Eighth District Dental Association, of New York. The above-named gentleman introduces his subject thus: “Hav-

* See “Notes.”

ing had for many years *exceptional* opportunities for obtaining information on this subject, the following points have been noted by me as bearing on the *question* whether '*Mercury is or is not admissible* in filling materials,' *i. e.*, filling teeth partially destroyed by decay." The paper continues: "There is undoubtedly a *strong prejudice* against it, and *this prejudice is* to a certain and very limited extent *well founded so long* as the *usual* practice of *most* operators is *adhered to*." (The italicizing is mine). "I have been in the habit," Mr. Fletcher states, "of purchasing amalgam *waste* for *refining* and taking an *assay* of the metals. I have never found in *any one* sample less than three times the proper proportion of mercury necessary. . . . I have more than once found from *seven* to *ten* times" (above) "the proportion. . . . It has been frequently stated that the mercury in amalgam is either *soluble* or *separates in some way* causing *constitutional mischief*. This may possibly be the case (although not probable) *if* we *use* what may be called a *weak solution of filings*" (filings of what?) "*in mercury instead* of using *mercury* simply as a *means* of obtaining a *welding surface*." Obscure as the meaning of all this is, the gentleman proceeds: "If we use it in the *latter* way there are few alloys from which the mercury will entirely *evaporate*, even at a clear red heat continued for some time." . . . "I have endeavored to evaporate the mercury perfectly from a small quantity of simple alloy by exposing it to a bright red heat in an open crucible for *one hour* and without success." . . . "I have also placed *weighed* plugs in a *rapid* current of *high pressure steam* for months continuously, and *found* not a *loss* of weight but an *increase* from oxidation" —increase of what? Here we are presented with an obscurity within an obscurity, leaving us in an entire state of ignorance as regards the individual character of the metals forming the "weighed plug," or whether it was a plug of compound metal in a state of oxidation previous to its having been subjected to a rapid current of high pressure steam for months; and if it were a "plug" of amalgam, whether its previous condition was its oxidation, and which of its combinations exhibited the "increase *from* oxidation," the metals amalgamated or the quicksilver amalgamating them?

With this mixture of confusion worse confounded we are gravely told that "In using gold or tin for plugging" (*i. e.*, filling in the cavities of decaying teeth) "the mechanical interference of moisture" (*i. e.*, moisture between the material and the walls forming the cavities) "is *absolutely nothing*, as when a plug is *finished* it has at once its *permanent* hardness, which enables it to resist *any attempt* at *remoulding* by the

pressure of capillary films of moisture." In a previous paper the gentleman recommended *varnishing* the interior walls of cavities as a security against capillary films of moisture. The essay continues, "A gold or tin plug, *be it good*, bad (!) or indifferent, *stands unchanged*, any failure taking place by alteration or decay of the tooth substance ; an amalgam *improperly* used, on the contrary, will commence the failure by its *own* alteration of shape as soon as the operator has left it." . . The essayist concludes, "*An amalgam may pack well and retain its form perfectly in a dry glass tube and yet be worthless in ordinary practice, as it may fail from want of power to retain its form in the presence of moisture. If it will retain its adaptation if packed under water it may be safely used in the mouth*"—i. e., the teeth.

The American dental practitioner, of all other nations, is an expert in filling and repairing teeth during the progress of their decay. It has ever been *his* ideal fondest theory that hermetically filling the dental material used *exactly* against the decayed surface of the interior walls forming the cavities in the teeth, it will "forever" resist (by "arresting") the further disorganization or disintegration of the teeth, either from the destructive effects of the action of chemico-external agents, friction, or as Mr. Fletcher puts it, "the pressure of capillary films of moisture." Notwithstanding all this applied skill and care of the accomplished dentist, the applying of millions upon millions of manufactured artificial teeth, sold by the dental depots, for the purpose of replacing the loss of the natural teeth, we have the logic of facts constantly presented before us, demonstrating the error, and that the immutable principles governing natural laws affect the natural teeth *in their time*, and that they decay and die !

If the occlusion of moisture from between the exposed walls of the cavities and the material placed in to fill them can be accomplished in opposition to the many antagonistic difficulties, and obstacles presenting themselves during the long hours of manipulating, and the too often vexatious conduct of patients themselves preventing the most expert operator "keeping the cavities dry" while endeavoring to accurately condense each particle of filling in its place, certainly, then, amalgam filling presents its peculiar claim of pre-eminence, often the inciting reason and cause for its use, over gold and tin-foils. Amalgam prepared *secundum artem* for *crystallization*, and the cavity in the tooth ready for its reception, the walls (with or without the aid of the rubber dam) for the short time required to line it with exactness, with this plastic material above the ridge of the external enamel, can be accomplished

imperviously against all surrounding extraneous or internal films of moisture.

My analysis or interpretation of Mr. Fletcher's communications during the last three years impresses my mind that so far from exhibiting any scientific question for the consideration of the dental profession worthy of its attention or exhibiting any desire on his own part to elucidate the enigmatical problem of scientific unintelligibility he has diligently proffered us, he rather seeks to amuse himself at our expense, or to excite our susceptibilities with a commercial bait attached to a very thin line of argument, whose attenuation is constantly mixing it in an entanglement with mercury of *uncertain quantities* without any idea attached to it of its mathematical connection with regard to its own *chemical purity*, and its negative compatibility with the several incompatible metals with which it may be, and according to Mr. Fletcher's showing is, *mixed*. If Mr. Fletcher, then, speaks from his own observation and investigatings the several varieties of amalgams "adhered to" by dentists in the British Isles, his knowledge of which derived from his "exceptional opportunities" doubtless is correct, and *a posteriori* justifies the "prejudice so long as the usual practice of dentists is adhered to." But when the gentleman transfers his home observations to the Eighth District Dental Society of New York, his points are pointless, and present no force and certainly no bearing on the question he propounds and utterly fails to answer, "Whether mercury is or is not admissible in filling," and his proposition is in no way applicable to the amalgam "adhered to" by the respectable dentists in the United States.

"Once upon a time," so commences our nursery legends, there was a prejudice superinduced in New York against the use of amalgam in the teeth, founded upon an entire ignorance of its properties and innoxious character and merits as a dental succedaneum. My father was the first who introduced this material into dental practice in the United States, in 1829. From that time to the present I have prepared and manipulated this now established resource of every dentist in the civilized world. Upon the subject, then, "Whether mercury is or is not admissible" in dental practice, thirty-five years ago I triumphantly disposed of that question, and secured its claim upon the confidence of the dental profession and the public mind, in my controversy with the late Dr. Eleazer Parmly, by my persistent challenging and defying him *to prove in the remotest degree, in a single case or instance, his assser-tion* that amalgam—*i. e.*, mercury—in any way caused injury to the teeth, or that its presence in the dental organs superinduced "consti-

tutional mischief," an assertion that Dr. Parmly entirely failed to meet or substantiate. Since then, 1845, experience has enlightened and taught its then bitter opponents to "fall into the line" of using it; and then, 1845, when ounces only of amalgam were used, *now* hundreds of pounds are applied by dental practitioners to the conserving of teeth that must otherwise be lost to the animal economy. Amalgam, too, presents one of the great features, "filling" the advertising sheets of every Dental Depot without exception.

I am here offered an opportunity of mentioning a singular oversight affecting the dental profession. During my forty-five years of medicodental practice, I have never, by any chance, met with a hint or reference in relation to metallic material applied to dental cosmology being in common subject to the known law in natural philosophy of EXPANSION, and, hence, *contraction*, and that these, the results of a natural force, are constantly reacting upon each other, by varying temperature, always from modes of living attending and affecting the teeth most in civilized life. Metallic dental fillings are not exempt from this natural law; and it acting both on the metallic fillings and the tooth substance, too often endanger the one and the integrity of the other, hence requiring the renewing of fillings *done* by "inferior operators." How many dentists lose reputation and business from this cause! The larger cavities—hence the thinner and *weaker* the walls—the greater is the mass of metal required to fill them; consequently the alternating expansion and contraction—shrinking of the metallic material—sooner or later separates its contact with the tooth substance, causing permanent fissures between the filling and the walls of the cavities, thus giving admission to "fibres of moisture" and wedgings from solids, which constantly cause them to fracture or break down.*

Amalgam-correlative metals, perfectly pure and of accurate applied proportions, correctly manipulated in a homogeneal molten mass, which, being allowed to slowly cool, and when cold reduced to proper angulated granules, and *united with distilled chemically pure quicksilver*, will form a plastic succedaneum, readily crystallizing into a compact, hard, solid mass, and presenting a material of equal merit—in some instances superior in importance—with any other used, and applied by dental practitioners for saving and preserving to the animal economy the original use of sound teeth. THIS IS THE USE OF MERCURY!

* The fissures thus produced by expansion and contraction must not be confounded with the decay ordinarily attending weakly organized teeth in ænemic constitutions, or with those fissures superinduced or caused by the chemico-electric action of the metals, and external agents, gastric acids, etc., nor with atrophy, the loss of vitality caused by medicine, quinine, iodine, iron, bromides, the preparations of mercury, alcohol, etc., administered and constitutionally saturating the animal system.

Those dentists, however, who, from carelessness or *ignorance*, adhere to the practice of procuring and using the crude or adulterated *quicksilver of commerce* from apothecary stores, will find—*no matter how excellently the compound metal is prepared for amalgamation*—that it will not crystallize, and that amalgam prepared with this kind of mercury *under all* circumstances presents a dirty, grayish-colored, porous, *friable* mass—both useless and injurious to teeth filled with it. *This is the abuse of mercury!* The exact or mathematical quantity of mercury to mix and unite with prepared metallic material for its perfect crystallization, is too simple either to occupy your time or the space of your columns.

I trust that the dental profession will hear from Mr. Fletcher often. Should the gentleman, however, again refer to the subject—“that the mercury in amalgams is either *soluble*, or *separates in some way*, causing *constitutional mischief*,” I hope he will bear in mind his own statement of having *failed to evaporate* mercury from amalgam, after his imperfect test of having exposed a small quantity in an open crucible one hour, to a bright red heat. I herewith, in addition, if the essayist and the dental profession require a positive proof of the innoxious character of quicksilver, refer them to—

“The following case of tape-worm and extraordinary treatment, related by Charles Caldwell, M. D., Professor of the Institutes of Medicine, etc., in the University of Transylvania.” The details of which will be found *in extenso*, published in the *Philadelphia Journal of the Medical and Physical Sciences*, vol. 1, page 135, with remarks upon the case from Daniel Wilson, M. D.; and the recommendations from the distinguished Dr. Physick to remedy the difficulty presenting itself—vol. 2, page 343, same publication.

“Mr. J. P., a merchant of New Orleans, had been subject to *tænia* for three or four years. After repeated and varied treatment some thirty feet of the worm had been expelled.

“At length the following prescription, derived most probably from Darwin’s *Zoonomia*, was given by a physician, who, if he had not acquired celebrity for his skill, at least became noted for the intrepidity of his practice :

Take

Hydraygri,

Stann’, aa 12 ounces. Fiat amalgama.

Misce.

“This metallic paste was directed to be divided into twenty-four doses, each, of course, weighing *one ounce*, and the doses swallowed at regular intervals of one hour.” The physician, deviating from the in-

terval prescribed by Dr. Darwin, ordered the doses to be taken every two hours. Of these the patient "took fifteen doses-ounces." "A portion of the tape-worm came away." Some time after "four ounces more of the amalgam were taken." . . . "Of the whole mass Mr. P. does not think that he evacuated more than two ounces, consequently seventeen ounces remained in the bowels."

Dr. Physick, to rid the bowels of the retained mass, recommended the administration of more quicksilver, hoping thereby to liquefy and separate the amalgamated mass. ("By the fact of a man having been relieved of a portion of tin bougie, broken and retained in the bladder, by injections of crude mercury into that viscus. N. Chapman, M.D., editorial remarks.")

What is most remarkable in this extraordinary case is its inactivity though so long retained. No after injury appears to have followed beyond the inconvenience, sometimes painful, caused by the shaking of the mass "when riding on horseback, or in a carriage, or jolting when descending stairs, steps, etc." Out of the narrative arise several questions (see *Philadelphia Journal*):

"1st. In what part of the intestinal canal is the amalgam lodged?"

"2d. By what kind of mechanism is it retained in its position?"

3d. What are likely to be its effects upon the system?

4th. What mode of treatment is best calculated to afford relief?

After years had elapsed and the case remained in the same passive condition, Mr. P. left New Orleans and the case was lost sight of.

Rio Janeiro, July 5, 1876.

EDITOR DENTAL MISCELLANY:

It was the booming of the cannons from the forts and war vessels in the harbor that woke me from my slumbers on the Fourth of July. Her Highness, the Princess Regent, had given orders that this day was to be saluted as a day of gala in commemoration of the Centennial of the United States. What better proof need we of sympathy? Everywhere we hear *Os Esta dos Unidos sao um grande paiz, Os Americanos um grande povo*. And as Americans can but admire (though the head of State is an Emperor) how liberal is this form of Government. However, it is not my wish to speak of politics in this paper; my desire is to give a few details of "the Fourth" in Rio.

The vessels in the harbor of all nations were decorated with flags and salutes were fired. Unfortunately there was no American man-of-war

on hand to respond to the salutes. All the principal monuments, public edifices and many private residences in the city had flags floating in the breeze.

The American residents of the city of Rio gave, in honor of the occasion, a banquet at the hotel d'Europa, which passed off handsomely. The guests consisted of the American Legation, one or two attaches of Foreign Embassy, the Minister of Justice, Minister of Marine, several notables, representatives of the press of Rio, and the American residents. Several toasts were offered by the Ministers and responded to by the American Minister. All were unanimous in praising our country, and the editors dwelt lengthily on the benefits we had derived from the press, asserting that it is the only way of enlightening and instructing the masses. American enterprise was ably defended and American science as well. All were enthusiastic over the talents of Agassiz and full justice rendered in his successor here present, Prof. Hartt. He responded by saying that if progress had been made in the explorations of the Amazonas and rich fields developed, it was by the aid of his Majesty the Emperor and the Minister of Agriculture, who did all in their power to make easier the task.

We must not omit the toast offered to the Emperor, now a guest in the United States, nor to the Princess Regent, who manifested a hearty sympathy in the celebration. The American people must certainly feel gratified at this expression of honor from a foreign land. In the evening there was a free distribution in the streets by Brazilian poets of copies of poems, a specimen of which I send you, as well as the *Globo*, the Liberal organ of Rio, which also will show you the feeling of brotherhood that exists in the hearts of Brazilians for the "Americanos."

With best wishes I remain yours truly,

DR. L. R. EBERT,

Surgeon Dentist to their Majesties and Imperial Highness of Brazil.

TRANSPLANTING TEETH.

DRAWING TEETH, CLEANING AND REPLACING THEM.

Some Curious Facts in the History of Dentistry—Old-Time Writers on Transplanting and Doctoring Teeth.

The aphorism that there is nothing new under the sun finds no stronger proof than in dentistry, notwithstanding all the discoveries and improvements in the operative branch of the profession. When the

importance of the teeth, both as regards the prime object of mastication and the beauty of the face, is considered, it is really no wonder that for hundreds of years past the best scientific ability has been devoted to their preservation and replacement in case of loss, and that it is the highest aim of the profession to-day to preserve them under all circumstances.

The popular notion is that when a tooth aches, the best, if not the only thing to do, is to have it extracted, and there are plenty of cheap shambles where this sort of irreparable defacement is done under the most soothing circumstances, so that one may, as it were, laugh while a bone is being wrenched from its socket and thrown away. We do not propose an essay on practical dentistry, however, but rather, by presenting some curious facts in the history of the profession, to show, first, that a practice in vogue nearly three hundred years ago is revived, and, lastly, that the preservation of the natural teeth is the best object to be attained for the patient. The practice alluded to was to remove the decayed tooth, repair and replace it in the socket again, and cases are reported where this was done, and in which the decayed tooth was thrown away and replaced by the sound tooth of another person ; success attended both operations. There exists, however, some doubt as to the permanency of the benefit thus derived ; but instances are not wanting, in modern practice, where operator and patient agree to give both methods, namely, the extraction, repair and replacement of diseased teeth, and the transplanting of sound, living teeth from one person's jaw to another—a thorough practical test.

There can be no doubt that the removal of the natural teeth inflicts irreparable injury to the natural beauty of the face, first, by destroying its expression and causing a collapse of the features ; and lastly, by destroying the natural powers of mastication, and subjecting the patient to the perpetual annoyance of artificial dentures. Of course there are cases where the latter are an inevitable necessity, but they never can wholly take the place of those useful ornaments set in the gate of life by the all-creating hand of nature. They bear the same relation practically and æsthetically to the human face that an artificial hand or limb does to the human form.

The celebrated Ambrose Pare seems to be the earliest writer who alludes to the practice of inserting the natural teeth of one individual in the jaws of another. In a work written by this author about the close of the sixteenth century he says : “ I have heard it reported by a credible person that he saw a lady of the prime nobility, who, instead

of a rotten tooth she drew, made a sound tooth, drawn from one of her waiting maids at the same time, to be substituted and inserted, which tooth, in process of time, as it were taking root, grew so firm that she could chew upon it as well as upon any of the rest. I have this but by hearsay." It is probable that Pare himself was somewhat skeptical in regard to the matter, as he is particular to tell his readers that his evidence was only "hearsay." Upon the subject of replanting the teeth he gives his own experience, which furnishes us with the first authentic record of the operation. After referring to the diseases of the teeth, their treatment and cure, the writer adds that "if the teeth become loose by a fall or a blow, they must not be taken forth, but restored and fastened to the next that remain firm, but in time they will be confined in their sockets, as I tried in Anthony de la Rue, who had his jaw broken with the pommel of a dagger, and three of his teeth were loosened and almost shaken out of their sockets; the jaw being restored, they were also put in their places and bound to the rest with a double waxed thread; for the rest, I fed the patient with broth, jellies and the like, and made astringent gargarisms of cypress nuts, myrtle berries and a little alum boiled in oxycrate, and I wished him to hold it a good while in his mouth. By these means I brought it to pass that he within a while after could chew as easily on these teeth as upon the other."

The edition from which these extracts were taken was translated from the Latin, and compared with the French, by Thomas Johnson, in 1617. Pare, let it be observed, died in 1590; he was born 1509, so that his book was written and published some time between those years.

In the eighteenth century, when all kinds of knowledge were much advanced, and the merits of different systems were fairly tested, the transplantation of teeth met with much disfavor from the most eminent representatives of the dental profession. This may be inferred from the following transcript from the work of Thomas Berdmore, surgeon-dentist to George III, King of England, who says:

"The surgeon's art has taught that a tooth that has been partially or totally forced out of its socket may be restored again to its former situation and firmness, and may serve for use and ornament to the latest period of life."

It further appears that his faith in replantation is not excessive; moreover, that empiricism was abroad then as now. He says: "But after all that has been said, I think it necessary to add, for the sake of undissembled truth, and to prevent the imputation of countenancing

the impositions that occur every day, that the success on all these occasions, however sufficient to justify the future trials and practice of honest and judicious people, is by no means equal to the extravagant assertions and promises of certain advertising impostors. In the most favorable circumstances it is more than an equal chance that a tooth once extracted or beat out will fasten again."

In a work published in 1774 by M. Patence, a dentist residing in London, we find the following: "I shall next consider transplanting the teeth, which of late years has been practiced by several persons, and is no other than extracting the tooth of one person and replacing it in the socket of another person. It is generally taken from some poor, indigent person, who, not knowing the consequence that attends such loss, consents to part with so useful an ornament, which can never be regained, for the sake of a few shillings, and it must certainly be highly offensive to the Almighty, for he never gave them for that purpose, neither are they their own to dispose of."

It has of late been asserted by a dentist that by means of a process known only to himself he could transplant teeth that had been extracted from the mouth any length of time, even after having carried them in his pockets till the roots were worn to a polish. His statement aroused the incredulity of almost every one, but M. Patence observes that "transplantation may likewise be performed in another manner: Take a tooth from a skull, or one that has been drawn for some time, lay it in water for three months to soak that it may open the pores; then take it out and put it in hot water for three hours, and when you extract the tooth from the person, this being fitted to the place, bind it fast with silk or weed to the other teeth."

In a work published in London, in 1778, by R. Wooffendale, a practical dentist, there is a more circumstantial detail of the mode in which teeth are to be transplanted, and of the uncertainties attending the undertaking: "The transplantation of teeth," says he, "is a very desirable operation when it succeeds, but it may not be improper to observe that the success in a great measure depends upon chance. A dentist may know which tooth is proper for the purpose of being transplanted, as, whether it is a perfect one, whether the enameled part is of the proper size, with respect to length, breadth, thickness, etc., but he cannot know whether its root will correspond in shape and proportion with that of the one whose place it is to supply till both are drawn, as it is well known the roots of teeth vary in these circumstances, notwithstanding the external and enameled parts perfectly accord."

The person with whom the transplantation of teeth found most favor was John Hunter. This celebrated surgeon, whose writings on the teeth appeared at a somewhat later period than the author's from whom I have just quoted, was so warm an advocate of dental transplantation, that he has been sometimes regarded as the author of the system. He endeavors to meet the difficulty of putting transplanted teeth into new sockets, in consequence of the deviation of these organs from a common type and size. "Considering," says he, "the almost constant variety of the size and shape of the same class of teeth in different people, it would appear almost impossible to find the tooth of one person that should fit with any degree of exactness the socket of another; and this observation is supported, and, indeed, would seem to be proved, by observing the teeth in elephants. Yet we can actually transplant a tooth from one person to another, nature assisting the operation, if it is done in such a way that she can assist. And the only way in which nature can assist, with respect to size or shape, is by having the fang of the tooth rather smaller than the socket. The socket in this case grows to the tooth. If the fang is too large it is impossible, indeed, to insert it at all in that shape; however, if the fang should be originally too large, it may be made less, and this seems to answer the purpose as well."

Hunter concludes his consideration of the subject of transplantation by giving a curious experiment, in which he designs to show "that a living tooth, when transplanted into some living part of an animal, will retain its life, and the vessels of the animal shall communicate with the teeth." "I took," he said, "a sound tooth from a person's head, then made a pretty deep wound with a lancet into the thick part of a cock's comb, and pressed the fangs of the tooth into this wound and fastened it with threads passed through other parts of the comb. The cock was killed some months after, and I injected the head with a very minute injection; the comb was taken off and put into a weak acid, and the tooth being softened by this means, I slit the comb and tooth into two halves in the long direction of the tooth. I found the vessels of the tooth well injected, and also observed that the external surface of the tooth adhered everywhere to the comb by vessels similar to the union of a tooth with the gum and sockets." The circumstances which led to the abandonment of the system of transplantation, after a fair trial by Hunter and many other able practitioners, are clearly stated by Dr. Joseph Cox, an eminent surgeon dentist, in a work published in 1814, on the natural history of the teeth. In his words, "The ill-success and unfortunate consequences that have sometimes occurred

have caused the practice to be abandoned for many years past. The other methods of supplying the loss of teeth are so unexceptionable and invariably successful, that we have no reason to regret the failure of the method of transplanting. I might, indeed, have observed that this operation involved in it a defect of moral principle, as one person is injured and disfigured in order to contribute to the luxury or convenience of another."

In a more recent work J. Lefoule, a distinguished dentist of Paris, denounces transplantation in the following terms :

"We consider it a sacred obligation to unite our voice to that of all the French dentists who have written upon this matter in a unanimous cry of reprobation against men who do not blush to lend themselves to the selfishness of the rich, which would avail itself of the misery of the poor to extort a tooth to replace one which, perhaps, was lost by intemperance or debauchery.

"We repeat it, that this traffic is almost banished from France, and that there is not a single dentist here who would lend his aid to it. We regret that England and Germany do not yet follow so praiseworthy an example."

From all scientific records it appears that the practice of transplanting teeth was fairly tested in the past age and rejected, both on account of the pernicious consequences with which it was attended, and the introduction of other means for effecting the same ends. The attempts to revive the exploded system at the present day are more unjustifiable, as great advancement has been made in the profession within the past fifty years, and greater resources have been brought within reach by the rapid progress in other arts and sciences. It would seem unnecessary to enter into further discussion respecting the inhumanity or impropriety of inflicting pain and injury on one individual in order to give another the chance of a very uncertain advantage. Nor is the evil confined to a mere failure of the operation or the troubles in the organs for which the remedies are designed. The danger of inoculation in the process of transplanting becomes the means of transferring the disease of one individual into another, and even the animal matter of the transplanted tooth may, under certain circumstances, prove very injurious by undergoing putrefactive changes. In view of all these evils, uncertainties and dangers, we must discountenance the revival of the discarded system, which could only have found favor in past times, when art, science and the morals of society were at a very low ebb, and which must be strongly condemned by the free and enlightened spirit of the present age.—

Cincinnati Commercial.

THE BRITISH MUSEUM LIBRARY.

The average American tourist, who lands at Liverpool with a thousand dollars in his pocket and the expectation of seeing the whole of Europe in a summer's vacation, generally gives London but brief notice. *Punch* lately represented a newly arrived Yankee as saying, "Yaas, I have come to do your Europe. Got to taown yesterday morning, saw London in the afternoon, and must be off to Paris to-day." Of course this is exaggerated, but the fact remains that Americans generally do not like to prolong beyond the briefest period possible their stay here; yet no city they can visit on the Continent will more richly repay careful study than this old, grimy, weather-beaten capital of England, where the extremes of wealth and poverty may be seen side by side, where the greatest need is met by the noblest distribution of charity, and where exist together ignorance dense as any type in heathen lands, and the richest and most generous opportunity ever offered to the student and scholar.

Of all its varied and numberless institutions the one which above all others commands my greatest admiration is the Library of the British Museum. Everybody who makes any pretense of seeing London at all visits the Museum; and after walking through its long galleries, with more or less notice of the treasures contained in its various departments, and after perhaps peeping through the glass doors of the reading-room, congratulates himself on having seen it. True, he has seen much over which he might have lingered for hours instead of minutes, and found sources of reflection for many future days. Here the mighty monuments of Egypt look down upon him in silent majesty, and tell of a civilization which rose and perished before ours began. Here are gigantic sculptures which once graced the entrance to the palace of Sennacherib in the mighty Nineveh. And here, face to face, he has beheld the finest monuments of ancient Greece, from the hand of Phidias himself, which Plutarch says were in grace and beauty inimitable; and which the greatest and most accomplished men of antiquity, Pericles, Sophocles, Socrates and Plato, Alexander and Cæsar, and a greater than all these, Paul the Apostle, had contemplated with wonder and admiration upon the pediments of the Parthenon. And yet I do not think he can be said to have seen its chief treasures, until he has made the acquaintance of the largest and best library in the world.

I am writing this moment in the Reading-Room of the Library, and

yet I find it not easy to give any adequate description of the munificence with which I find myself surrounded. Above my head rises an azure dome over a hundred feet high, and in diameter exceeded by but one other in the world, that of the Pantheon at Rome. The room is circular, lighted from above, the walls of which contain a part of the Library, though the greater part is in the quadrangle surrounding the rotunda. The lower shelves form a magnificent library of reference, dictionaries, classics, cyclopædias, collections of standard works upon all subjects which may be consulted on the spot without the formality of a ticket; and so admirably arranged that by reference to a plan, attached to each table, one is enabled to find immediately the locality of the books he desires. To procure a book or manuscript from the Library its title is written on a printed form, and in a few minutes the article desired is laid on your desk. There is no limit to the number of books one may consult at the same time; he may have one or fifty; but the more valuable manuscript collections are to be seen only in a room by themselves. To each reader is allotted a space four feet long by two wide. Comfortable easy chairs, stuffed, caned or wood-seated, are ranged at the tables, and he is supplied free of charge with pens, steel or quill, blotting-pads, paper weights and knives. A shifting metal-framed reading-desk, graduated so as to hold a book at any angle required, and a shelf for extra books or papers, covered with russet leather, fold up into the partition before each student, when not in use. Accommodations exist for over three hundred readers, all of which are in constant use.

If one is engaged in no special study the great variety afforded him is of itself almost confusing. Any one of a million and a half of books is at his service. Numbers convey so little an idea of the size, that a comparison with others may be permitted. The largest collection of books in America is the Congressional Library at Washington, which numbers 261,000 volumes; this of the British Museum is more than five times its size, and probably a thousand times more valuable. The Mercantile and the Astor Libraries, the largest in New York, neither contain 150,000 books; so this is ten times as large. Besides these there are over 75,000 manuscripts, charters, ancient deeds, parchment books, the rich workmanship and pride of wealthy abbeys and monasteries long before the invention of printing. All these records, extending from the earliest known periods of the preservation of literature, of the most select and diversified description, are accessible in the shortest space of time to any desiring to consult them.

One involuntarily asks, "To whom does this priceless collection belong?" To the British Nation. It is now about a century and a quarter since Parliament appropriated twenty thousand pounds to the purchase of the collection of books, manuscripts, etc., of Sir Hans Sloane, which by the terms of his will were offered to the nation at that price, though originally costing over £50,000.

The nation had already become the owner of the Cotton Library, a most valuable collection made two and a half centuries ago, when large numbers of chronicles, charts, etc., at the dissolution of the abbeys, were finding their way into the libraries of private persons. Then the Harley collection, made by the Earl of Oxford, was acquired. In 1757 George II presented the library which had been collected by the Kings of England from the time of Henry VII; and with it annexed a privilege which every year becomes more and more valuable, that of being supplied with a copy of every book published in Great Britain. In 1823 George IV presented the nation with the library of his father, which had been gathered by him during his long reign at an expense of a million of dollars.

Of the smaller gifts, each a library in itself, space does not permit enumeration, though by no means insignificant or few. Hardly a year passes but what this great institution is enriched by the bequest or gift of books or manuscripts, the owner finding no disposal so fit as a gift for the common use of mankind. And Parliament well guards the trust. The growth of the Library averages 30,000 volumes per year, and the annual grant of public money by Parliament, for the expenses of the Museum and for additional purchases, is not less than a quarter of a million dollars. One cannot help imagining the delight and wonder of the old founder, could he to-day revisit the collection and see what has sprung from his bequest. Little could he have anticipated that the books and manuscripts which he was so long in gathering and of which he was so proud would have swelled into that almost unfathomable ocean of literature, the Museum Library; or that his few, and not very valuable works of art would be the germ of a grand school for English sculpture, where the richest treasures of ancient Greece should be the daily text-book for hosts of students. Above all he could not have foreseen that his carefully-guarded treasures would one day with perfect safety be thrown open for the free inspection of the common people, that a million persons should visit them in every year, and as many as 40,000 in a single holiday.

And now, possessed of the most precious Library in the world, how

does England use it? If she confined its privileges to the use of Englishmen, who alone have gathered it, paid for it, and now support it, she would be acting no more selfishly than every owner of valuable property thinks himself justified in doing. If she charged a fee for the use of the room, as some small contribution towards its enormous expense, no foreigner at least could complain. But the nation rises to the exercise of a generosity higher than the selfish principles of political economy, and as wide as the race. She says: "I own the most valued and best library that exists, and I offer it to the scholars of the world. The finest reading-room that can be built for money shall be provided, and furnished with every convenience that a student can need. I make no distinction of persons, beyond knowing them; the proudest noble of the Empire shall obtain no greater privileges than the poorest scholar; Christian and Pagan, Turk and Jew, black and white, rich and poor, men and women of all nations, all creeds, all conditions—capable of appreciating its use—are alike welcome, and invited to participate in its benefits. Ask for anything it contains, from a manuscript a thousand years old and worth more than its weight in gold to a pamphlet of yesterday, and it shall be brought you. Its treasures are yours while you use them; but their preservation shall continue independent of the existence of any man, and long after the hands that to-day hold them are mouldering into dust. The care, the preservation, the cost shall be mine; the use, I offer to humanity."

Is not this a phase of Communism? It is certainly very like it. What have I done, that kings and nobles should have devoted their fortunes and lives in the accumulation of such treasures for my use and enjoyment to-day? Nothing. It is the perfection of liberality, of generous giving, of sharing with others the gathered fruitage garnered by years of industry and expenditure of untold wealth. My dress may be shabby and my purse empty; but beneath the dome of the British Museum I am served with a banquet which emperors cannot command nor all the gold in existence purchase.

Does there not seem to be a tendency in civilization toward a freer sharing with others of that which wealth has gained; and may we not, therefore, expect that as nations grow rich, and more enlightened, they shall grow more and more generous, until the channels of distribution become wider and deeper and more varied than we now imagine? Who shall set bounds to what a lover of Christ and Mankind may yet accomplish? To-day we make free a Museum, a University, Hospitals, Asylums, Parks and Gardens, Schools and Libraries—to-morrow may

it not be Food, Labor, Homes, Security from Poverty, Healthful Employment, opportunity for Culture? They are sad problems that confront us, but some time shall they not be solved? Perhaps not, after any fashion of which we dream. Yet I believe that one day not one man in ten thousand, but all nations and all mankind, shall come to know that far greater than the pleasure of gathering is the enjoyment of giving.—*American Socialist.*

AMERICAN DENTAL ASSOCIATION.*

SIXTEENTH ANNUAL SESSION OF THE AMERICAN ASSOCIATION.

The sixteenth annual session of the American Dental Association was opened in the chapel of the M. E. Church, Broad and Arch Streets, Philadelphia, Tuesday, August 1, 1876.

Dr. A. L. Northrop, of New York, occupied the chair. The other officers are:

First Vice-President—H. J. McKellops, of St. Louis; Second Vice-President—H. A. Smith, of Cincinnati; Corresponding Secretary—J. H. McQuillen, of Philadelphia; Recording Secretary—C. Stoddard Smith, of Springfield, Ill.; Treasurer—N. H. Goddard, of Louisville, Ky.

Executive Committee—L. D. Shepard, of Boston; M. H. Webb, of Lancaster; George L. Field, of Detroit; A. H. Brockway, G. R. Thomas, G. H. Cushing, M. H. Webb, G. C. Daboll, T. L. Buckingham and S. B. Palmer.

The proceedings were opened with prayer by Rev. Dr. Morgan, of Nashville, Tenn., after which the minutes of last year's session were read and the roll of members called.

The following is the list of dentists present: Drs. F. Abbott, New York; John Allen, New York; W. H. Allen, New York; J. J. Anderson, Springfield, Ill.; W. H. Atkinson, New York; W. H. Acheson, Ohio; T. L. Buckingham, Philadelphia; Alonzo Boice, Philadelphia; C. M. Bailey, Minneapolis, Minn.; E. A. Bogue, New York; G. T. Barker, Philadelphia; C. H. Biddle, New York; A. H. Brockway, New York;

*Our efforts to secure a stenographer for the session of the Association having been thwarted after we relied upon them, we compile our report from the various newspapers of Philadelphia, with also some assistance from the *Cosmos*. We think our readers will find the report as complete as they could desire.

George H. Cushing, Chicago; J. W. Clowes, New York; C. D. Cook, New York; J. N. Crouse, Chicago; M. S. Dean, Chicago; M. W. Foster, Baltimore; George L. Field, Detroit; J. Foster Flagg, Philadelphia; F. J. S. Gorgas, Baltimore; E. S. Gaylord, New Haven, Conn.; M. H. Goddard, Louisville, Ky.; J. Hooper, Covington, Ky.; A. W. Harlan, Chicago; J. L. Hill, Gettysburg, Pa.; R. F. Hunt, Washington, D. C.; F. A. Hunter, Cincinnati; C. Kingsbury, Philadelphia; G. W. Klump, Williamsport, Pa.; M. Lukens Long, Philadelphia; A. E. Lyman, Warren, Ohio; G. B. McDonnell, Erie, N. Y.; Charles Merritt, New York; G. A. Mills, Brooklyn; J. Frank Marriner, Ottawa, Ill.; W. H. Morgan, Nashville, Tenn.; H. J. McKellopps, St. Louis, Mo.; James McManus, Hartford, Conn.; J. H. McQuillen, Philadelphia; A. L. Northrop, New York; S. B. Palmer, Syracuse, New York; C. N. Pierce, Philadelphia; A. O. Rawls, Lexington, Ky.; F. H. Rehwinkel, Chillicothe, Ohio; Spencer Roberts, Philadelphia; T. C. Stellwagen, Philadelphia; H. L. Sage, Bridgeport, Conn.; C. Stoddard Smith, Springfield, Ill.; D. D. Smith, Philadelphia; J. H. Smith, New Haven, Conn.; C. S. Stockton, Newark, N. J.; E. D. Swain, Chicago; J. B. Thompson, Newberry, S. C.; J. S. Thompson, Abbeville, S. C.; J. Taft, Cincinnati, Ohio; G. R. Thomas, Detroit; J. Wetherbee, Boston; A. J. Waide, Newton, Iowa; W. T. Wallace, Kingsville, O.; Amos West, Philadelphia; M. H. Webb, Lancaster, Pa.; F. S. Whitsler, Youngstown, Ohio.

The following resolution, offered by Dr. L. D. Shepard, of Boston, was adopted :—

Resolved, That dentists not residents of the United States whose names shall be approved by the Executive Committee be invited to seats in the Association and to participate in the discussions.

In accordance with this resolution, Drs. Erastus Wilson, of Havana, Cuba; T. J. Thomas, Madrid, Spain; J. Carlos Gardiner, Madrid, Spain; Wm. A. Vice, Liecester, Eng.; W. H. McGrath, Brazil; N. Emmons, Chili; George Cunningham, London; W. St. George Elliott, Yokohama, Japan, were introduced to the Association and the former read a short address.

The Committee on Physiology, not being quite ready to report, on the call of the Chair, the regular order of business was on motion suspended and Drs. John Allen and A. H. Brockway, who were a special committee to consider the effect of dental practice upon the health of the dentist, reported through their chairman, Dr. Brockway also furnishing an essay on the subject. The report asserted that the peculiar

nature of a heavy dental practice tends to overtax the system more than other professions. This is not only due to the close confinement to which dentists are subjected, but also to the intricate, long and trying operations which they are continually called upon to perform, and to their neglect of certain established universal and irrevocable laws of nature.

In the practice of medicine there is a constant variation of employment, and a constant change of air and scene, which renders the practice of the physician far more healthful and less taxing than the operations of the dentist, often difficult and annoying, and conducted altogether in the house. In some cases dementia results. The use of narcotics and stimulants was denounced; they should be avoided, particularly by overworked dentists, as the habit once established an increased desire for them is manifested and their baneful effects produced. They enable the system to use up its stored force—that is, to borrow from itself; this loan, however, must be met, otherwise physiological bankruptcy results. A special recommendation was that operating rooms be arranged with a close regard to ventilation, and also that the office hours be lessened and more time devoted to recreation.

DR. A. H. BROCKWAY's paper, treating the subject of "The Health of the Dentist as influenced by the Modern Mode of Practice".

A well-grounded belief is established that the practice of dentistry unduly taxes the energies and strength, lowers the standard of health in its followers; hence, this Association appointed a special committee to examine the subject, and the means (if any) for conserving the health of dentists.

The purpose of his paper was to show that because of the improved methods of practice, there is a better outlook for the dentist of the future.

The melancholy statistics of the committee's report would tend to alarm us for ourselves or our friends. A marked improvement has taken place in these methods in the last decade, both in the ideas which govern them and in the means and instruments employed. In reference to the change in ideas, the prominence which has of late been given to the subject of amalgam has been observed by some with regret. From being almost proscribed, it comes back to the ranks, emancipated and disenthralled by the genius of scientific and unprejudiced investigation, and takes its place as a valuable and indispensable adjunct in saving a large class of teeth. The change in this respect has been for the benefit of the practitioner in a physical point of view at least, as

it saves hours of exhausting effort required in restoring with gold pulpless and more or less broken-down teeth. Another example, not so marked, is the more general use of non-cohesive foil, and the combination of gold and tin, by which the comfort and convenience of the operator are promoted (irrespective of their merits, as compared with cohesive gold), involving far less time. More enlightened and intelligent ideas upon the treatment of nerve cases and irregularity, wedging, etc., also lighten the burden of the practitioner. The employment of an assistant at the chair is also conducive to the relief of the operator, saving him a hundred little steps and movements, besides running the engine and malleting his fillings. The recent approved appliances—the mallet, the rubber dam and the engine—are doing a vast and incomparable amount of good to the profession in the matter of physical well-being, besides subserving the interests of the patient. They not only relieve the severe and protracted muscular effort, as is the case with the mallet and engine, but the dam spares the mental anxiety attendant upon the operation of filling with napkins—which is far more exhausting than the physical exertion. These means are destined to work powerfully in favor of the dentist, by lessening and abbreviating his labors, leaving him more leisure to enjoy outdoor exercise and recreation.

The Committee on Credentials presented a report of the names of delegates present from other associations, which were as follows :

American Academy of Dental Science—Prof. L. D. Shepard.

Chicago Dental Society—Dr. A. W. Harlan.

Susquehanna Dental Association—Dr. W. H. Hurtz.

Baltimore College of Dental Surgery—Dr. F. J. S. Gorgas, M.D.

New York Odontological Society—Drs. J. W. Clowes, Benjamin Lord and William Jarvie, Jr.

Lake Erie Dental Association—Dr. G. B. McDonnell.

Odontographic Society—Drs. M. Long, C. A. Kingsbury, Alonzo Boice, William J. Potter and J. L. Eisenbrey.

North Carolina State Dental Association—Dr. W. H. Hoffman.

Kentucky State Dental Society—Dr. J. M. Hooper.

Philadelphia Dental College—Prof. Thos. C. Stellwagen.

First District Dental Society of the State of New York—Drs. J. Bond Littig and Charles Miller.

New York College of Dentistry—Dr. Wm. H. Allen.

Ohio State Dental Society—Dr. W. B. Acheson.

Pennsylvania Association of Dental Surgeons—Dr. Wm. H. Truman.

Alumni Association of the Pennsylvania College of Dental Surgery—
Dr. Henry W. Moore.

Iowa State Dental Society—A. J. Waid.

Pennsylvania College of Dental Surgery—Prof. George T. Barker.

Pennsylvania Association of Dental Surgeons—Drs. E. H. Neall,
Amos Wirt and Spencer Roberts.

Connecticut Valley Dental Association—Drs. H. W. Strang and J.
H. Smith.

Maryland Dental College—Prof. M. Whelldin Foster.

California State Dental Association—Dr. George McCowen.

Boston Dental College—Prof. I. J. Wetherbee.

New Jersey State Dental Society—Dr. Charles S. Stockton.

Illinois State Dental Society—Drs. C. S. Smith, M. S. Dean and J.
N. Crouse.

South Carolina State Dental Association—Dr. J. R. Thompson.

The discussion of the subject of the paper from the Committee on the General Health of Dentists was opened by Dr. C. E. Kingsbury, who said that this was a very important subject, as he had found in his own case. The dentist suffers from too close confinement. Brawn is as essential to him as brain, and this he endeavors to gain in his own experience by taking a vacation of some weeks in the summer. If there is any profession which taxes the nervo-muscular system, it is the dental. If the lawyer and the clergyman require a vacation, so does the dentist, as much or more. We live upon too high a grade of social life, in too great a degree of refinement, which does not contribute to health and longevity. Such men as Agassiz, Holmes and Emerson have set us the example of leaving the haunts of civilization and going to the wilderness, where they can breathe the free oxygen of nature. The speaker has found great benefit from this course. He spends his vacation among the lakes and mountains, engaged in angling, which is enjoyment and recreation. This course contributes to happiness and efficiency; the loss of the time is compensated by increased health, and if the dyspeptic and exhausted would follow the plan, they would be renovated and recuperated. The remarks of Dr. Allen in regard to stimulants are gratifying, and their truth must come home to us. There is a growing tendency in this country to the use of spirituous liquors, even among the gentler sex. The medical profession can fix their eyes on numbers of their talented members who have gone to a premature grave from alcoholic stimulants. They are good in their place, but their excessive use is evil, and that danger must be guarded against.

Though producing a temporary brilliancy, yet a reaction occurs which carries the system below the point of exhaustion. If any class of men should abstain, it is our profession. How can we have a clear brain and a steady nerve if we do not? We must preserve our systems in their best state.

PROF. BARKER, of Philadelphia, said that he was disappointed at the position of the committee, although he agrees with some of their views; they have ignored facts. Doubts that the profession is so exhausting; there is in his opinion no profession better calculated to prolong life and develop the faculties; and those now entering it will yet see that this is the case. The chairs in use twenty years ago were low and wide, and the position occupied by the operators than was painful and constrained. Now, what do we see? We must have an unrestrained peristaltic action of the bowels, and the man who has produced a chair that enables the operator of to-day to have this, as the chairs now in use do, deserves the gratitude of the profession. The profession of dentistry develops the man; calls for skill, ingenuity and thought, a high action of the brain and of the physical system. Besides this, the patients with whom we have to do belong to the best classes, and mould, elevate and increase the vital force. We may, to be sure, have a child, or some other exhaustive patient; but the next one gives strength. One reason for the prevalence of dyspepsia among us is that we ignore the simplest laws of health; we operate from morning till dinner-time, rush down to dinner, bolt our food, overtax the digestive apparatus, occupy a constrained position, and divert the blood, which the experiments of Beaumont show should normally flow to the capillaries of the stomach after eating; this blood we divert to the arms and other parts of the body. He has met dentists from all over the country, and they spend as little money in the bar-room as any other body of men; the proprietors of hotels say this also. Alcohol, as a medicine, is priceless; in consumption and some other diseases it is the main reliance.

PROF. FLAGG, of Philadelphia, said he knew all about the effects of rum and tobacco; for fifteen years past he had known nothing of them practically; he could speak from experience of both sides, and testifies against their use. Does not believe in the productive power of alcohol; has never seen a case where its internal use has been beneficial; but, on the contrary, has seen any number of cases carried to the grave by it.

DR. BARKER said he wanted to be understood that he is not an advocate of the use of rum and tobacco; but denies that the best writers do not claim that alcohol has certain nutritive properties.

DR. WETHERBEE, of Boston, is surprised to hear Dr. Barker advocating the doctrine that there is nourishment in alcohol. Our best American and foreign writers, who are level-headed, conclude that alcohol does not nourish. That conclusion is just and cannot be controverted. The ground has been well gone over in the papers read, and he wishes to hold up the writers' hands. Among the resources for recovery from exhaustion he would place prominently a horse, used both under the saddle and in the carriage. Horseback-riding for the dyspeptic is best, and the harder the horse, the better the exercise. He himself uses both. Walking after work he finds fatiguing. Smoking and chewing are generally to be eschewed, though there may be cases where tobacco is a remedy for a terrible disease, and the only known remedy. He has been made sick by the fumes from a patient, which may do more in three hours to break down health than three days' hard work. If he had had the modern inventions thirty years ago, he would have saved several years' time; by the old style of operating the dentist's days were shortened and made unendurable.

DR. KINGSBURY, of Philadelphia, said that he had not found horseback exercise to compare with the benefits to be derived from the forest and stream. He amuses himself on these excursions by carrying an instrument for measuring the miles he walks, and an aneroid barometer, for measuring heights.

DR. MORGAN, of Nashville: It has been assumed that the refined habits of modern society have deteriorated the public health. That is a wrong name; it is not refinement which has done it, but dissipation, and a disregard of the laws of life and being. He cannot answer for Philadelphia in regard to spirits, but he defends the female society of his State, as well as the male, from the charge of an increasing use of spirits; it is eschewed, and not found on the tables even upon New-Year's day. He was not aware that dyspepsia is peculiar to our profession; but if we follow the advice which has been given us, to go to the chair in the morning, and work till night without eating, we shall be dyspeptic. Fourteen dentists have died in his State in fifteen years, and of that number ten died of consumption, in a region where that disease is not prevalent; three of the others died from urinary trouble, and out of eight now in bad health, six suffer from lung trouble. There is a want of free oxygen—pure air—and full, nourishing food at proper intervals. There is a constrained position, even with improved appliances, and the abdominal organs suffer. Is astonished at the position of Prof. Flagg in regard to alcohol. The ablest men have not

been able to manage typhoid and cholera without it; in the Southern country no intelligent physician proposes to dispense with it.

DR. REHWINKEL, of Chillicothe, Ohio: The points of the last paper are well taken. He wants to raise his voice against the idea that our profession is a trying one. When we meet our old friends of fifteen or twenty years ago, we find them looking so fat and hearty, and so much better than heretofore, that we can hardly recognize them; they do not look as if their profession had exhausted them. Climate and locality have a great deal to do with it. No writers, except Flagg, in his "Pathology and Therapeutics," have touched upon it.

PROF. STELLWAGEN, of Philadelphia: Each position has a certain degree of justice. A certain amount of alcohol is sometimes necessary to stimulate, when the assimilative power is dormant and old cells must be used over. A temporary bridge over a stream is sometimes necessary; so it is sometimes necessary to bridge over a failure of the vital functions. But no physician should ever recommend the use of so powerful a drug without controlling it by stipulating the dose. That is the true medical use of alcohol. To prescribe a glass of whisky at dinner means whisky *ad libitum*. To work hard all the year is a prodigal manner of living. When a machine needs oiling, it is better to stop the factory before it breaks down. He finds it better to take his vacation as he goes along, rather than to work three hundred days and then search for health sixty-five days. He reserves one afternoon a week, besides Sundays, devoting the half-day to various kinds of recreation. He had learned not to carry his business home with him. Concentration can only be kept up for a certain length of time. It is suicidal to eat heartily in the middle of the day.

DR. THOMAS, of Detroit, said that he had found his health ruined under his former practice of walking a mile to his dinner at one o'clock. He had changed his mode of life: has his office at his residence, goes to his chair at eight o'clock, operates till two, has an hour for consultation, and dinner at three, after which he does no hard work.

Adjourned till two o'clock.

AFTERNOON SESSION.

The discussion of the papers read in the morning was continued.

DR. McDONNELL, of Pennsylvania, thought Dr. Allen might be misunderstood; he did not suppose he would object to the use of alcohol as a medicine. Admitting its medicinal value, what medicines are properly used constantly? Dentists must obey the laws of nature, and

not be interrupted at their meals. Having his office in his house had resulted in loss of health to him, and he now walks to his meals. It is essential to be clear of patients at these times. One man, however, may be able to endure what another cannot.

DR. STOCKTON: The special committee was appointed on the ground of the alleged insanity of dentists. Our calling does not make men insane. Some things lead in a measure that way, and should be avoided if possible. At some times and for some patients we can work with more ease and more successfully than at other times; we should then change patients, for if we operate for those not in accord we shall injure ourselves. As to liquor, the moral sentiment of the community has changed for the better.

PROF. D. D. SMITH, of Philadelphia, knows of no statistics by which we may judge of the healthfulness or otherwise of dentistry. Dr. Morgan's remarks were of that nature, and if followed up would be interesting and useful. He regards the calling as one tending to shorten life. Of the learned professions, the clergyman is the longest-lived, the physician next, and the lawyer next. True advancement in civilization and mental culture tends to longevity. That people attains the greatest average years which attains the greatest mental culture, while living upon true temperance principles. The improvement in dentistry is not due so much to appliances as to the advance in intellectual attainments. Societies and colleges have lifted the calling to a position of great respectability since 1839. There has been a general elevation of tone throughout the profession of the country; and to it is due increased longevity.

DR. ATKINSON: If we could lay aside partisan feeling and endeavor to get at what constitutes food, poison and remedy, we should be more likely to arrive at correct conclusions. We hear on the one hand that alcohol is nutrient, and on the other that it is a poison. We do not know enough to assert positively what becomes of certain substances that disappear when introduced into the system. Anstie says that most of them may be collected, but still there is a portion lost. He goes with all who go against the use of alcohol, but does not want to tell a lie to bolster up the truth; he would rather be a simple *truthist*.

PROF. MCQUILLEN, of Philadelphia, questions the statements of Dr. Allen as to the exhausting effects of our profession, and its tendency towards insanity. He questions the propriety of mentioning names, as did the paper of last year. The question is, Is it true? We have too limited a basis of statistics to say definitely. But the evidence seems to

prove that it is in the rural districts, among the farmers, that the greatest amount of insanity occurs. Our profession is not more exhausting than any other followed with devotion. Men fall martyrs to other callings so followed.

DR. MCQUILLEN then followed with the report of the Committee on Physiology. The report treated on the topic of "The Eruption of the Deciduous and Permanent Teeth," and stated that there were rare cases on record of children having been born with teeth, but usually the central incisors make their appearance between the sixth and eighth months of infancy, the lateral incisors between the seventh and ninth months, the first molars between the fourteenth and sixteenth months, the canines between the seventeenth and eighteenth months, and the second molars between the twenty-fourth and thirtieth months. About the period of the eruption of the first molar, a systematic disturbance occurs in most cases caused by the tooth in its efforts to erupt through the gum, being compressed by the resistance of the gum upon the pulp, producing the consequences through the medium of the fifth pair of nerves. In explaining the method of eruption and disappearance of the deciduous teeth, and the mode of eruption of the permanent teeth, he called attention to the fact that his own comparisons with the recorded observations of Messrs. John Tomes and Edwin Saunders, of London, had manifested that eruption of the permanent teeth in America occurred considerably earlier than in England and France, thus seeming to indicate a precocity in our favor.

In speaking in relation to Dr. McQuillen's paper, Dr. Atkinson said that it had been established by authority that twelve times the limit of the shedding of the central incisors is the normal length of life. Therefore an early development in this respect was indicative of brevity of existence, while a later development seemed to predict longevity.

SEMI-ANNUAL MEETING OF THE CONNECTICUT VALLEY DENTAL SOCIETY FOR 1876.

HARTFORD, CONN., JUNE 13TH, 1876.

Called to order at 2 o'clock P. M.; President Bishop in the Chair.

On motion of Dr. Taylor, the reading of the records of the last meeting was postponed until the Annual Meeting.

Voted, That a committee be appointed by the Chair to receive applications for membership.

The Chair accordingly appointed as such committee Drs. Riggs, Jones and McManus.

Voted, That Prof. J. E. Garretson, M. D., D. D. S., of Philadelphia, be elected an Honorary member of this Society.

Dr. Shepard, the Chairman of the Committee on Publication, reported progress, and stated that in his opinion the work in hand would be completed by the next Annual Meeting.

Voted, To now proceed to the discussion of "The Treatment of Exposed Pulp in Deciduous Teeth."

DR. NOBLE considers the exposure of pulps in deciduous teeth as among the most perplexing cases that come into his hands, and often feels uncertain as to what course to pursue.

DR. SEARLE: When I come across an exposed pulp in a deciduous tooth, I extract the tooth first, last and all the time.

DR. RIGGS: This class of cases are often, indeed, very perplexing, but I do not remove the teeth. My method is to destroy the pulp, if exposed, and fill. Uses creosote and arsenious acid in very minute quantities, for the purpose of destroying the pulp. Considers it very important to save the deciduous teeth in order to prevent irregularities in the permanent set.

DR. JONES: My method is similar to that employed by Dr. Riggs, with this exception: I make an artificial opening into the pulp cavity at the neck of the tooth, after filling, for the free discharge of pus, in order to avoid periosteal inflammation.

DR. RIGGS: I remove the pulp after devitalizing, and fill the root cavity when practicable, but often find the foramen so large that it is nearly impossible to do so.

DR. SHEPARD abhors the practice of extracting deciduous teeth in every case when the pulp is exposed. He does not treat such cases as in adult teeth. As a rule he has not had any success in attempting to save the pulp alive; generally destroys the pulp. If the tooth is an incisor he does nothing but attempt to quiet the pain; but in all other cases he tries to retain them as long as possible, in order to prevent irregularities. Cited cases of irregularities resulting from the premature extraction of the deciduous teeth.

Before the six-year molars are erupted he considers the retention of the deciduous molars of very great importance. After the six-year molars are erupted he considers the retention of the deciduous molars

of less importance. He devitalizes the pulp in various ways. It can frequently be removed with but little pain. Sometimes uses a little arsenic, allowing it to remain but a few hours without examination, repeating the application if necessary. Considers creosote, used in connection with arsenic, of value only as a vehicle.

DR. RIGGS frequently uses pulverized charcoal and arsenic in equal quantities. Simply saturates the pellet of cotton with pure *wood creosote*, so that it will take up a very small quantity of arsenic. The creosote serves to hold the nerve in painless quietness, while the arsenic "*puts in the big licks.*"

His object in using the charcoal with the arsenious acid is, that he may thus be enabled to more accurately determine the precise amount taken up on the cotton and applied to the pulp.

DR. GARRETSON: In the treatment of exposed pulps in the first teeth, Dr. Garretson remarked that it did not seem to him possible to lay down any rule which could contain much of the virtue of reliability. Each case possessed its own character, and he who was to find himself able to best serve the patient, was he who found himself able to best read the circle of the subject. Did not find himself able to agree either with those who advise the extraction of aching deciduous teeth, or those who say they are not to be extracted.

Circumstances alter cases oftentimes so materially that one is glad enough to extract, that greater evil may be avoided; assuredly it is to be esteemed the case that the premature removal of these teeth interferes more or less with a harmony which should characterize the coming in of the second set.

Without entering into a discussion of the subject from such a standpoint, which Dr. G. thought neither necessary nor desirable under the circumstances of the meeting, he offered his own manner of treatment.

Assuming irritation to be the cause of the pain in every instance, the search was to be after that which irritated. Most commonly this would be found in the presence of a foreign particle, a crumb, perhaps, bitten into the tender organ in the act of mastication. To remove a particle of this or any other nature when bearing upon a tender tooth-pulp would certainly be the directions which a man would receive from his common sense. It is not always the case, however, that in the removal of the offending agent the pain is found to be removed with it; the reason for this is, of course, that an inflammation has been developed. We have then a pulpitis to treat. To abort or resolve such a congestive condition there are few, if any, means more reliable

than a combination of lead-water with laudanum. A very satisfactory formula is as follows:

Plumbi Acetatis, gr. v.

Tincture Opii, gtt. xx.

Mix.

Aquæ, one ounce.

To apply it nothing more is necessary than to saturate a pellet of cotton and lay it delicately within or about the cavity of the aching tooth.

Not unfrequently it is found the case that the teeth of children ache because of the presence of much acid in the mouth; the acid irritates the exposed pulps. In these cases the cause is easily enough discovered by means of a piece of litmus paper, and is as easily removed by washes of an antacid nature. Chalk and water, for example, or ammoniated water, or lime-water. When a reverse condition exists, the saliva being stringy, acids, both internally and locally, is the indication. Lemonade is perhaps as good as anything else.

In the many cases in which an explanatory cause is not very evident it is well to prescribe a powerful sedative. Amongst the best of such order of medicaments is the sulphate of atropia:

Atropiæ Sulphatis, gr. i.

Mix.

Aquæ Destillatæ, oz. i.

To be applied with care, as it is a very poisonous agent. It is safely used by saturating with it a piece of cotton corresponding with the cavity in which it is to be used.

A good general rule is to precede all such applications by washing out the cavity of the aching tooth, using warm water.

In those cases in which pulpitis results in periodontitis, and this in its turn engenders chronic congestions of the associate parts, it would seem to be the least of the evils to extract the tooth.

DR. SEARLE: My convictions are that we confer a greater benefit and avoid a greater evil by removing a deciduous tooth when the pulp is exposed than by destroying it and filling the tooth. We thereby avoid a greater danger from the evil effects resulting from periosteal inflammation, etc. It may be the means of producing irregularities, in very rare cases, but considering the possible unfavorable results from both courses of treatment, I consider the removal of a temporary tooth, when the pulp is exposed, as less objectionable.

DR. ATKINSON discussed the question at length in his usually interesting and unreportable manner. Believes that when the pulp is exposed it should be devitalized, removed and the tooth filled. If the

pulp is already dead, would disinfect and fill the root cavity with oxychloride of zinc.

DR. ANDERSON: It is very well to say what ought to be done in certain cases, but some of our young men here may be misled. Our patients often will not allow us to use our best judgment, and we must do as we can. I extract the teeth of children nearly every day, simply because I must.

In my opinion arsenic has no right to a place in the office of the dentist. I have not used it since 1869.

DR. SHEPARD: Our practice is necessarily divided into two classes, and we are compelled by the circumstances of the patients to treat them differently; consequently we are forced, against our judgment, to extract, even though we know it to be an injury to them.

Voted, That Dr. Stockwell be added to the Committee on Publication.

Adjourned to meet at 8 o'clock in the evening.

EVENING SESSION.

The entire evening session was very happily devoted to a lecture by Prof. J. E. Garretson, M.D., of Philadelphia.

Subject—"The Clinical Signification and Treatment of Tumors of the Mouth, Jaws and Face."

The lecture was an exceedingly interesting and valuable one, and was listened to with marked attention and appreciation by the entire convention, together with representatives of the medical fraternity and prominent citizens of the city.

After the lecture the convention accepted an invitation from Dr. McManus to proceed *en masse* to his residence, where occurred an enjoyable season of social intercourse with the doctor and the distinguished guests of the Society.

The Society have abundant occasion to long remember this evening's session, both for its mental feast and social characteristics.

MORNING SESSION.

June 14th, 1876.

Opened at 8 o'clock A. M.

DR. NOBLE presented a case of ankylosis of the jaws, the patient being a girl of about eleven years, and the disease being one of long standing. A clinical examination was made by Drs. Garretson and Atkinson, one in the absence of the other, in which it was clearly de-

monstrated that doctors sometimes disagree, both in diagnosis and treatment.

Voted, To now proceed to the discussion of "Anæsthesia."

DR. BISHOP, calling Vice-President Clapp to the Chair, said : Having suggested to the Executive Committee that the subject of Anæsthesia be placed on the list for discussion, I beg leave to offer a few remarks:

It seemed to me, Mr. President, very proper in this our Centennial year, when we were summing up the progress in our profession, not to overlook one of the greatest discoveries of this or any other age in its importance to humanity. An agent has been brought to light by our profession and given to the world, the greatest boon it ever received in discovery to allay human suffering.

No science developed in surgery or discovery in *Materia Medica* is at all comparable to this agency as a blessing to mankind, and we lay just and indisputable claim to it with professional pride.

This not only seemed to me the time, Mr. President, but also the *place*—and I wish we might, as a body, meet around the statue of Dr. Wells, and admire that noble face and head which is such a correct picture of his features, and there clasp hands in a reverential circle to his memory ; but if we have not time to do this, let each one visit the spot, and in reverential sentiment carry out the idea.

Here, and now, let us renew our claim, that the younger men in our profession may have its history, and not forget how easily the merits and claims of a discoverer are lost. In steam we had Fitch and Fulton. In anæsthesia we had Wells, Morton and Jackson. And in these claims we may congratulate ourselves that we have been blessed with so good and important a witness as we have had in Dr. Riggs of this city, who was present at the first operations by nitrous oxide, in December, 1844, and assisted in them at that time, and made record of the same in his books, which we may all see.

I wished to speak particularly myself at this time, because I can so fully corroborate Dr. Riggs' testimony. Dr. Wells, of this city, discovered the usefulness of nitrous oxide, or laughing gas, for allaying pain, in the year 1844, and had operations both here and in Boston under its influence. Nearly two years later, in the fall of 1846, Dr. Morton brought the ether prominently before the profession in Boston, and is fully entitled to the credit of its introduction as a practical anæsthetic. But for quite a time gas and ether were known to Wells, Morton, Riggs and Jackson and others as agents to produce unconscious-

ness, yet were sleeping in disuse. In the fall of 1846, a very short time after Morton's experiments in Boston, I wish to state my personal connection with its introduction into several cities, and how I can thus corroborate the facts stated by Dr. Riggs in regard to Wells' knowledge of the existence of these anæsthetics at that time.

Very soon after Morton's use I purchased from him the secret, and with my partner, Dr. Harris, introduced the first operations by ether in the city of Worcester.

At once I visited New York and administered the ether there, first or surgical operations in that city, which were in the offices of the late Dr. John Burdell, and of Dr. T. B. Gunning, now of that city. In New Haven I gave the ether first in the office of Dr. Weit. I gave Dr. Searls, of Springfield, a knowledge of what it was.

In the city of Hartford I called on one or two, and when I found Dr. Wells he at once told me the whole secret; I came to impart to him, so, instead of teaching him, I was taught of him more than I knew in the matter. Dr. Wells, in his great enthusiasm, gave me then the whole history of these discoveries, and his mortification that by reason of some imperfect experiments he had been checked in his sanguine faith that they would be practical at once, but still firmly believed that they were to become the fulfillment of his ideas. In 1847 Dr. Simpson, of Edinburgh, evolved chloroform from these discoveries, which gave us an agent that came into general use. Thus much, Mr. President, I wished to say in regard to the history of these discoveries, and not for any personal pride of being instrumental in its introduction into several cities.

Now of these several anæsthetics I have given the chloroform more than either of the others, and I am sorry to differ from high authority, and from so distinguished a surgeon as Dr. Garretson, and yet I feel chloroform is safe when anything may be discreetly used, and I believe it to be as good an anæsthetic, if not the best, in our profession for what is called minor surgery; although I do not advocate its use, or the use of any other, nor do I like to have it sweepingly set aside as dangerous, when it is often the only safe and effective agent of the three. I regret that the Massachusetts Dental Society should make the administration of chloroform censurable by a resolution upon their record. I think such a policy too restrictive to impose upon educated gentlemen, and while I don't expect the young or ignorant to use it freely, yet its virtues should not be lost.

DR. MILLER cited a case of fatal result from the administration of

chloroform in the city of Pittsburg a few years since which came under his special notice, where the agent was administered by an acknowledged expert as a medical practitioner, and said that *experience*, so called, in the administration of chloroform, even when combined with caution and more than ordinary professional acquirement, does *not* entitle *any man* to that confidence which enables him to say with one of our much esteemed brothers, that "Chloroform in *my hands* works well," and is considered sufficiently safe to justify its administration for the extraction of teeth. So long as no human sagacity is able to detect, in advance, those systematic conditions which render life incompatible with the presence of chloroform, there is absolutely *no* experience in that direction, and no safety except in total abstinence.

The case cited, which came under my observation in the city of Pittsburg, is only *one* of the *many* which force upon us these convictions.

DR. RIGGS thinks that it is time that the dentists understand this agent, which sprung from their own midst, so that they may know how to administer it as safely and successfully as the physicians do; and he is not by any means sure but that as a class they already do. Has seen many instances where physicians were exceedingly bungling, to say the least.

Believes that the time will come when chloroform will be almost solely used as an anæsthetic. In competent hands thinks it no more dangerous than ether or nitrous oxide gas. He cannot submit to the dictation of any society which says that he shall not use any one of these agents.

DR. SEARLE: I have administered chloroform in my practice, more or less, for fifteen years. When nitrous oxide gas came into use I adopted it quite generally. Never did like ether. Experience of others indicates that chloroform is more dangerous than sul. ether; I had rather hurt my patients sometimes, than to run the risk of killing them.

DR. C. S. HURLBUT: In India they are in the habit of dealing with wild animals, when young, as pets; but the time comes when the pet becomes the master, and turns upon them. So it is with chloroform. Has had considerable experience with chloroform, but never feels certain as to results. In more lengthy operations uses gas to bring the patient into the anæsthetic condition, and holds them under by the use of ether.

DR. RIGGS wants to know if gas is not a dangerous agent.

Believes one-half the danger in the use of ether and chloroform is

incurred by the manner usually adopted in administering it. The napkin or sponge is held too close to the face. There should be a space between the face and sponge, so as to admit of free inhalation of air with the anæsthetic agent, and so that the sponge may not become filled with the exhalations from the lungs.

We should administer it slowly, and not hurry the patient under its influences. Gas is just as unsafe as chloroform. Ether is often inefficient; while *good* chloroform brings the patient rapidly under, and if properly administered, is just as safe as any anæsthetic. The operator must be able to *recognize* the anæsthetic condition, whether it comes as the result of the *first* or *fiftieth* inhalation. Otherwise he should not give it.

DR. SHEPARD thinks that it is not right that this discussion should close without some word of caution to the younger members present. He would not like to take the responsibility of advocating the general use of so dangerous an agent as chloroform for so minor operations as those which usually come under the head of dental surgery. He would hardly feel justified in administering chloroform in any case, and thinks that in minor surgery at least we should ignore it and let it entirely alone.

DR. NOBLE would like to have considered for a moment some of the adverse symptoms manifested in some cases. Cited cases in his own practice when such symptoms were apparent. When rigid, spasmodic symptoms appear, he immediately withdraws the anæsthetic.

DR. GARRETSON: Dr. Garretson said he felt that he had so fully discussed the subject of the relative merits of the two anæsthetics, ether and chloroform, in his work on Oral Surgery, that it scarcely seemed necessary for him to say anything further on the subject. He would repeat, however, that his fear of chloroform had not been lessened by experience, and that the circumstances would have to be peculiar in which he would feel himself justified in administering it for a simple operation. Ether he considered quite as safe as wine, and would have as little hesitation in giving the one as the other; had never met with, or known, of an accident certainly attributable to ether. Remarked that if gentlemen would continue to use chloroform, they should feel themselves prepared to diagnose diseases of the heart; not being able to do this, escape from accident would seem to be attributable solely and wholly to luck. If he would attempt to lay down a rule for cases in which chloroform never should be used, would apply it to the persons of any and all people that had rheumatism; such persons,

almost without exception, have their hearts more or less affected and cannot be exposed to chloroform without danger.

DR. ATKINSON raised the question as to "How chloroform acts?" "Does it ever kill?" "What is death?" etc., and proceeded to discuss them at length in his own inimitable manner. Argued against the general use of chloroform as an anæsthetic, and warned Dr. Riggs of the danger he would incur of having a patient die in his office under the influence of chloroform if he continued its use.

DR. RIGGS: The irritability spoken of is caused by the manner of administering it. If the sponge or napkin is held too near the face, so that the patient can inhale nothing but the fumes of the chloroform, then we may expect unfavorable results. If administered in very small quantities it acts as a nervine.

Should I meet with the misfortune of having a patient die on my hands I shall not go out and hang myself, for I shall have the satisfaction of feeling that I used my best judgment, believing that it is based upon the truest knowledge in connection with the whole matter.

Voted, To pass the subject.

Voted, That the thanks of this Society be extended to our distinguished guests, Prof. J. E. Garretson, M.D., of Philadelphia, and W. H. Atkinson, of New York, for their presence with us on this occasion.

The Chairman on Membership reported the following list of applicants, who were ballotted upon and declared elected; to wit: Drs. G. N. Snow, H. Ben Ober, C. W. Strang, C. B. Coolridge, A. M. Ross, C. Fones, H. L. Sage, C. M. Many, W. J. Goodwin, W. W. Sheffield, Henry Bentley and J. D. Bentley.

Adjourned, to meet at 2 o'clock P. M.

AFTERNOON SESSION.

Called to order at 2 o'clock P. M., President in the chair.

By request of the Society, Dr. W. H. Atkinson, of New York, read an essay upon "*Tumors and Abscesses*," and Dr. C. S. Hurlbut, of Springfield, Mass., reviewed "*The Rise and Progress of Dentistry in U. S. A.*," in a brief historical essay. After which "*The Use and Abuse of the Dental Engine*" was, by vote, taken up.

DR. RIGGS: I suppose this question was suggested because of the fact of a case which came into our office a short time since for treatment. Judging from the symptoms manifested and the operation of filling the tooth, as related by the patient, I became convinced that in preparing the cavity with the engine the pulp of the tooth was penetrated

by the drill. The circumstances of the case compelled me to extract the tooth. I did not disturb the filling, but placed the tooth, as extracted, in alcohol.

I now propose that a committee be appointed to extract the filling from the tooth, and thus ascertain whether my suspicions are correct or not. If, by the carelessness of operators, this blunder is likely to occur, it ought to be "*smoked out*" at once.

Voted, That a committee of three be appointed by the chair to carry out the suggestion of Dr. Riggs.

The chair accordingly appointed Drs. Searle, Sheffield and Smith to constitute said committee.

The committee at once proceeded to attend to their duty, and reported that they found that the suspicions of Dr. Riggs were, in their opinion, substantially correct.

Adjourned.

C. T. STOCKWELL,
Secretary.

THE DENTAL PROFESSION.

Referring to the same letter which we published last month, from Mr. John Tomes, of London, the editor of the *Medical Press and Circular*, also of London, says:—

In another column we print a letter from Mr. John Tomes, in which the main points of the discussion affecting the dental profession which has occasionally occupied a portion of our space during late weeks, are set forth temperately and clearly. Our readers will not be surprised to find that we have been in complete accord with the opinions of Mr. Tomes and the party which he represents—that part of the dental profession to whose labors the speciality entirely owes its present position. With characteristic modesty, Mr. Tomes refrains from mentioning the fact that the good work to which he alludes has been accomplished through the energy and wisdom of himself and his coadjutors, some of whom, unfortunately, have now passed away. Twenty years ago it may be said there was no dental profession, and the vast majority of dentists were unqualified. There existed, however, a considerable minority of educated professional men pursuing the practice of the specialty, some possessing diplomas, and others, although accomplished dentists, and sometimes men of scientific attainments, without recog-

nized qualifications. This minority, after much discussion, at length united themselves into a body, with the object of promoting the advancement of dentistry and rescuing it from the hands of the ignorant charlatan. With this view the Odontological Society was founded, the College of Surgeons was induced to establish a special qualification for dentists, and efficient schools for the education of dental students were organized. Since 1858 the progress of the profession has been continuous, and it has been recruited by a large number of properly educated dentists, much to the elevation of the specialty and to the benefit of the public. The Odontological Society has continued to form a bond of union between all that is good in the specialty. A scientific body in the main, it has kept a due watch over the professional conduct of its members; comprising all the most eminent dentists, it has not refused its membership to any practitioner duly vouched for as an educated professional man, whether possessing a diploma or not. In this way it has tended to the elevation of the whole body of dentists, its membership being sought and valued as a stamp of honorable position, and many unqualified practitioners have doubtless been induced to practice their calling as a profession instead of as an inferior trade, in the hope of meriting the membership of the society. When it is remembered how important is the union of all interests worthy to be united in furthering the progress of a profession under such circumstances, it will be seen that the Odontological Society has acted wisely in not making itself a small association, to the exclusion of whatever power and energy was further available. The holders of the license in dental surgery formed the largest party in the society, and to some of them dental reform owes most; next in numbers come those without diploma, comprising many excellent dentists. Lastly, the remainder is composed of the comparative few holding full degrees in surgery. Seeing what this judicious combination of available force has accomplished with such excellent promise for the future, and how equally the credit of what has been done must be divided among all parties, it is easy to understand the resentment which has been aroused by the recent action of a small section of the qualified members of the profession, who, with no real claim whatsoever to a position of leadership, have set themselves up publicly as the sole pioneers of a new departure in the path of reform, and by excluding from their ranks not merely unqualified practitioners, but also the licentiates in dental surgery, insulting by implication an honorable section of the profession, and one to which, as we have said, the whole body owes, to a great extent, its present respectable position.

NOTES.

Meeting of the N. Y. State Board of Censors.

At the late meeting of the Board of Censors of the Dental Society of New York, the degree of "Master of Dental Surgery" was conferred upon the following gentlemen, who had passed a successful examination:

T. H. Burras, M.D., New York; J. S. Walter, Rochester; J. Morgan Howe, New York; W. S. Elliott, D.D.S., Goshen.

Salicin and Salicylic Acid in Rheumatism.

Dr. MacLagan, in the *British Med. Jour.*, thus compares the merits of the two substances as remedies for rheumatism:

As I am probably the only person who has experience of both salicin and salicylic acid in the treatment of acute rheumatism, perhaps I may be allowed space for a few remarks on the merits of these two remedies.

Which is the better remedy, salicin or salicylic acid? That each exercises a marvellous influence in cutting short an attack of acute rheumatism, there can be no doubt. I have used salicin or salicylic acid in every case of acute rheumatism which has come under my care since November, 1874 (a year and a half), and invariably with the same result—a rapid cure of the disease. Seeing a patient suffering from acute rheumatism, I have no hesitation in assuring him that within forty-eight hours, possibly within twenty-four, he will be free from pain. That is a very different tale from any that can be told in connection with any other remedy.

Salicin is the remedy which I used first, but I have not confined myself to it. When salicylic acid was first recommended as a febrifuge, I determined to give it a trial in acute rheumatism. In the first case in which I used it, ten grains were

ordered every two hours. On seeing the patient after four doses had been taken the general condition was a little better, but she complained much of the medicine "burning her throat." I urged her to continue it. This she did, and on the following morning the pain was less, and the temperature had fallen from 102.3 to 101.1; but to the burning sensation in the throat was now added sickness. I omitted the salicylic acid, and gave the same dose of salicin, ten grains every two hours. The sickness ceased, the burning sensation in the throat disappeared, and by the following day the pain was entirely gone from the joints and the temperature had fallen to 98.8. She made a good recovery.

This case well exemplifies what is the chief objection to salicylic acid—its tendency to produce irritation of the throat and stomach. I may have been unfortunate in my experience, but in every case in which I have given it this irritation has been complained of. All writers on the subject agree in referring to this irritation as one of its unpleasant effects. The salicylate of soda seems to give rise to the same disagreeable symptom. Salicin, on the other hand, never gives rise to any unpleasant effects. I have prescribed it within the last year and a half in many different ailments, in doses ranging from five to thirty grains. I am probably within the mark when I say that I have thus given it to at least a hundred different people, and I cannot recall a single instance in which any disagreeable effect was produced.

I have myself taken (by way of experiment) three doses of sixty grains—one in the forenoon, one in the afternoon, and one at night—without experiencing the least discomfort; but the smallest pinch of salicylic acid produces in me a feeling of

heat and irritation in the throat, while a dose of ten grains gives rise to gastric irritation and a most unpleasant burning sensation in the fauces.

Salicin is a pleasant bitter, and is given mixed with a little water, flavored with syrup of orange if desired. In adequate doses, say fifteen grains every two hours, it cuts short an attack of rheumatic fever, without producing disagreeable effects. It should be continued in smaller doses during the first fortnight of convalescence.

As remedial agents in acute rheumatism, salicin and salicylic acid seem to be equally efficacious; but the former has the advantage of producing no unpleasant effects. In time, too, it is sure to be much cheaper, a matter of some importance with a large class of sufferers from rheumatism.

Some Notes on Aniline Black.

BY S. CABOT, JUN.

There has been much discussion, in late years, upon the subject of aniline black, both as to its technical application, and with regard to its chemical properties and formula.

My experiments upon the latter part of the subject lead me to believe that, as ordinarily seen upon cloth, aniline black consists of a salt, or perhaps a mixture of salts, of a number of organic acids of a red color combined with a base of a greenish color.

This base I believe to be quite similar to rosanilin in its chemical constitution, but not so strong a base. Like rosanilin, however, it contains (if freed from the acids mentioned above), I believe, *no* oxygen. It can combine weakly with mineral acids, and I may at some future time be able to discover its atomicity through means of this fact.

The red and purple-colored acids, on the other hand, appear to be oxidized products; some of them, like indigo, may be reduced by the action of grape sugar and alkali, and are *reoxidized* by contact with the air.

In the ordinary methods of making aniline black—*i. e.*, by the action of chloric acid upon aniline oil—large quantities of ammonia salts are found which remain in the filtrate, as may be easily seen by boiling the same with an alkali. This fact proves distinctly that the black itself must contain less nitrogen and less hydrogen than the aniline from which it is made.

And now with regard to the practical part. It has long been a great “desideratum” to obtain a *steam* aniline black that was sufficiently good and cheap, and did no injury to the fibre. Many printers, knowing that acetic acid was a volatile acid, and not of great use in steam colors, have attempted to substitute it for other acids in the printing of this black, with *absolutely* negative results. I have shown by experiment that the cause of this ill success is the formation of *acetanilide*, upon which the oxidizing agents have not the effect desired. I believe in the case of the use of tartaric acid the same difficulty is sometimes to be experienced through the formation of a similar compound in which one of the hydrogen atoms of the aniline is replaced by the acid radicle or tartaric acid. Where chlorate of potash is used, however, this tendency is partly counteracted by the great tendency to form the insoluble bitartrate of potash.

The only steam aniline blacks that appear as yet to have any great technical value are those made with ferro or ferridcyanide of aniline in connection with a chlorate.

The great step which should next be made in the preparation of this color, is the introduction of the use of more soluble chlorates than that of potash—for instance, that of soda. Much inconvenience would thus be avoided from crystallization of the chlorate of potash in the color while printing, and the consequent destruction of both “doctors” and “rollers.” It would also render possible the use of much stronger solutions of chlorate, which will be of great use in steam colors.—*American Chemist.*

JOHNSTON ADJUSTABLE FOUNTAIN SPITTOON.



The defects of the Fountain Spittoons hitherto made are, that it is almost impossible to keep them from leaking, and that they occupy a rigid position close to the left of the chair, and hence prevent the operator from working on that side.

These defects will not be found in this spittoon, which is commended to the favor of Dentists by the following points of merit :

1st. It is readily adjustable to the position of the chair ; that is, it can by an easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches to the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way.

3d. Instead of a wooden case, twelve inches square, is an ornamented metal tube one and a half inches in diameter, which will not warp, occupies very little room.

4th. Movable joints are so arranged that any leakage is impossible, since the waste from the bowl never comes to the joint itself, but is discharged below, in the bottom of the lower half of the socket of the globe, and conveyed into the waste pipes.

5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

6th. All its bright parts are of gun metal, and its tubing silk covered. The water jet used is the device of Dr. Redman, of Louisville, Ky.

Price.....	\$60 00
Boxing	2.00

JOHNSTON BROTHERS, 812 Broadway, N. Y.

The Morrison Dental Chair.



Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure for those who may so desire *the rotary movement*, some of these chairs have legs, into which castors are cast. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and as pictured on the chair has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of \$8.00.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

PRICES.

In fine green or garnet plush—with Morrison Head-rest.....\$ 150.00
Boxing..... 5.00

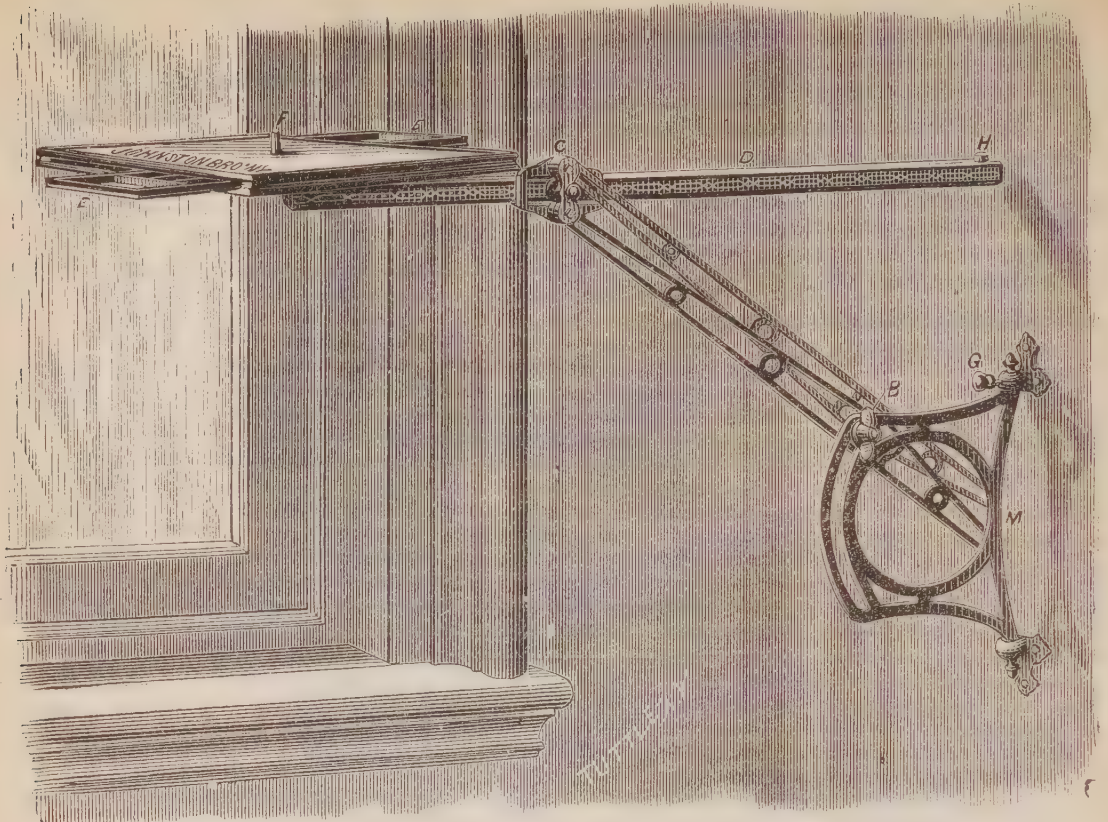
To which price add, if ordered :

With Castors.....	10.00
With Johnston Head-rest, instead of Morrison.....	8.00
With extra back-pad.....	4.50
With spittoon attachment and porcelain cuspador.....	8.00
With nickled metallic cuspador and gold trap.....	10.00
With Turkish upholstery.....	15.00
Real morocco embossed.....	10.00

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

MORRISON DENTAL BRACKET



PRICES.

With Black Walnut Table, 12 inches square.....	\$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather.....	40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket.....	17.00.
Boxing.....	\$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

- 1st. It combines a greater variety of range and movement than any other.
- 2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
- 3d. It provides a clean receptacle for foil and instruments.
- 4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
- 5th. Its drawers extend through the table and can be opened from either side.
- 6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

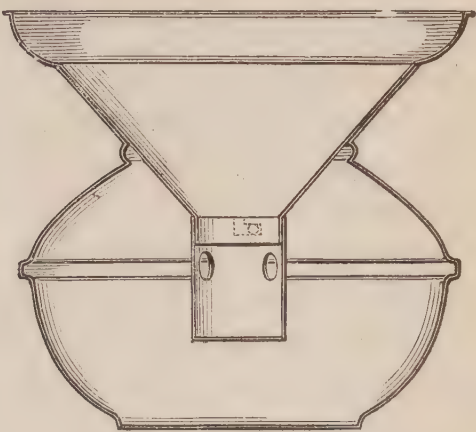
JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

NICKEL PLATED CUSPADOR WITH GOLD-TRAP.



CUSPADOR.



Section of the cuspador, showing the Funnel with gold-trap attached.

The cuts represent a metallic cuspador, handsomely nickel plated throughout, designed to fit the spittoon attachment of the Morrison Chair. As the funnel can be removed by simply lifting it from the Cuspador, all parts are as readily cleaned as is the porcelain Cuspador now in use. The gold-trap—which is an attachment of the funnel—will, in a short time, effect a saving sufficient to pay for the Cuspador.

PRICES.

Spittoon Bracket, plain.....	not pictured.....	6 00
“ “ Nickel Plated— “ “		8 00
Nickel plated Cuspador and Funnel with Gold-Trap. .		\$10 00
Funnel and Gold-Trap.....		3 50

JOHNSTON BROS.,
812 Broadway, N. Y.

TOOTH BRUSHES.

A first-rate article.

4 Row Brushes, per dozen.....	\$3 00
5 “ “ “ “	3 80
Children’s Brushes “ “	2 30

JOHNSTON RBOS.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or "chattering" which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

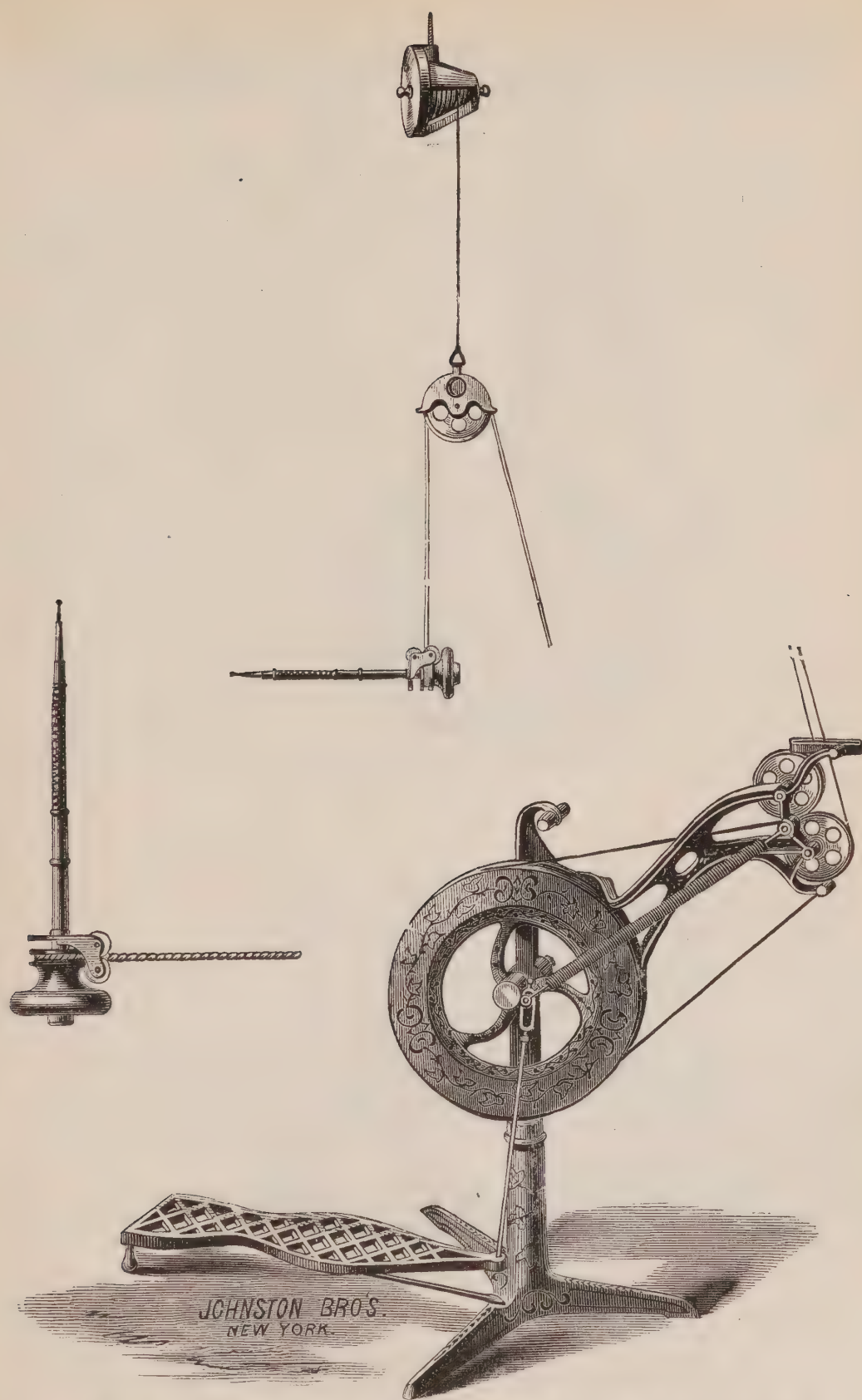
4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a "*light running*" Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

• Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROTHERS, 812 Broadway, N. Y.



SUSPENSION DENTAL ENGINE.

(DR. ELLIOTT'S INVENTION.)

Price, \$50.00. Right Angle Attachment, \$5.00. Boxing, \$1.00.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($\text{NO}^2 + 2\text{O} = \text{NO}^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid Nitrous Oxide*, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 206,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether.....	I	death to 23,204 administrations.	
Chloroform.....	I	2,723	"
Mixed Chloroform and Ether.....	I	5,588	"
Bi-chloride of Methylene.....	I	7,000	"
NITROUS OXIDE.....		no Deaths in 75,000	"

Edward R. Squibb, M.D., than whom our country has no more able pharmacist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

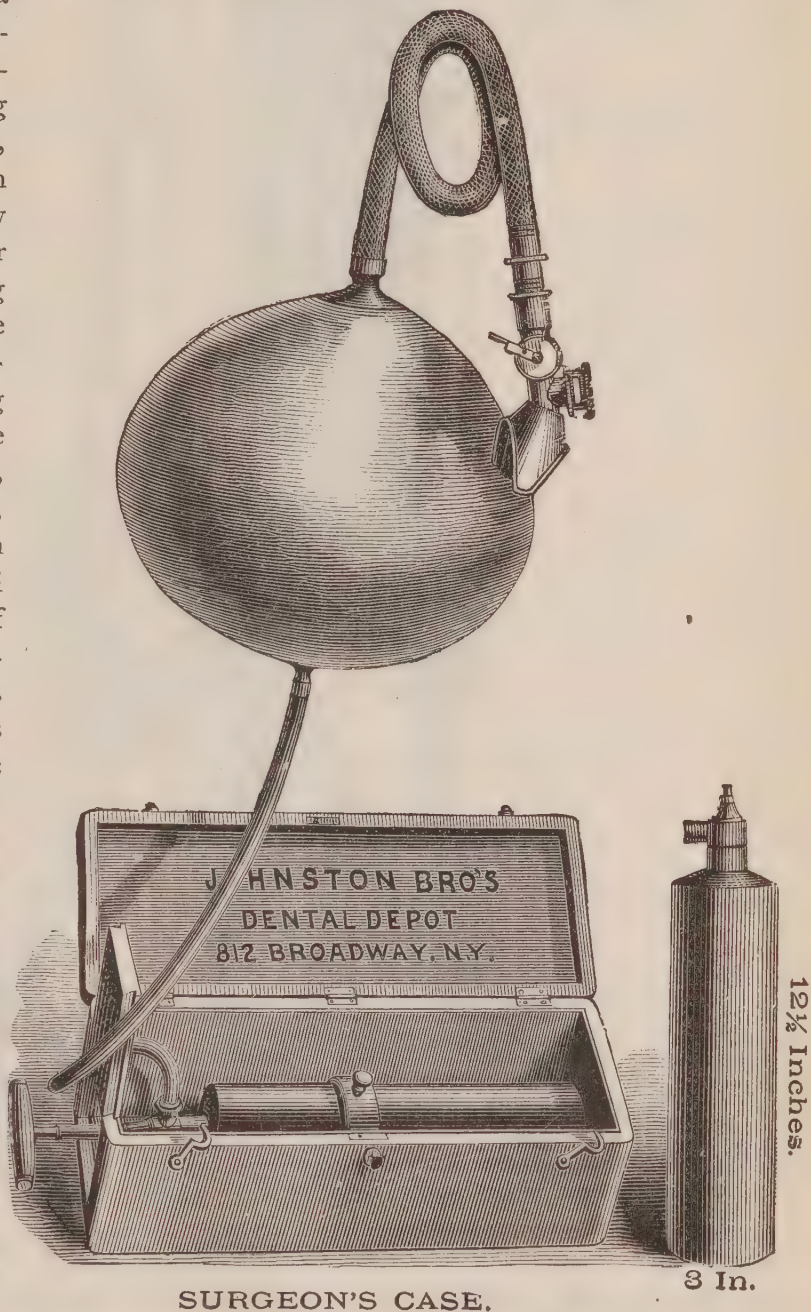
When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

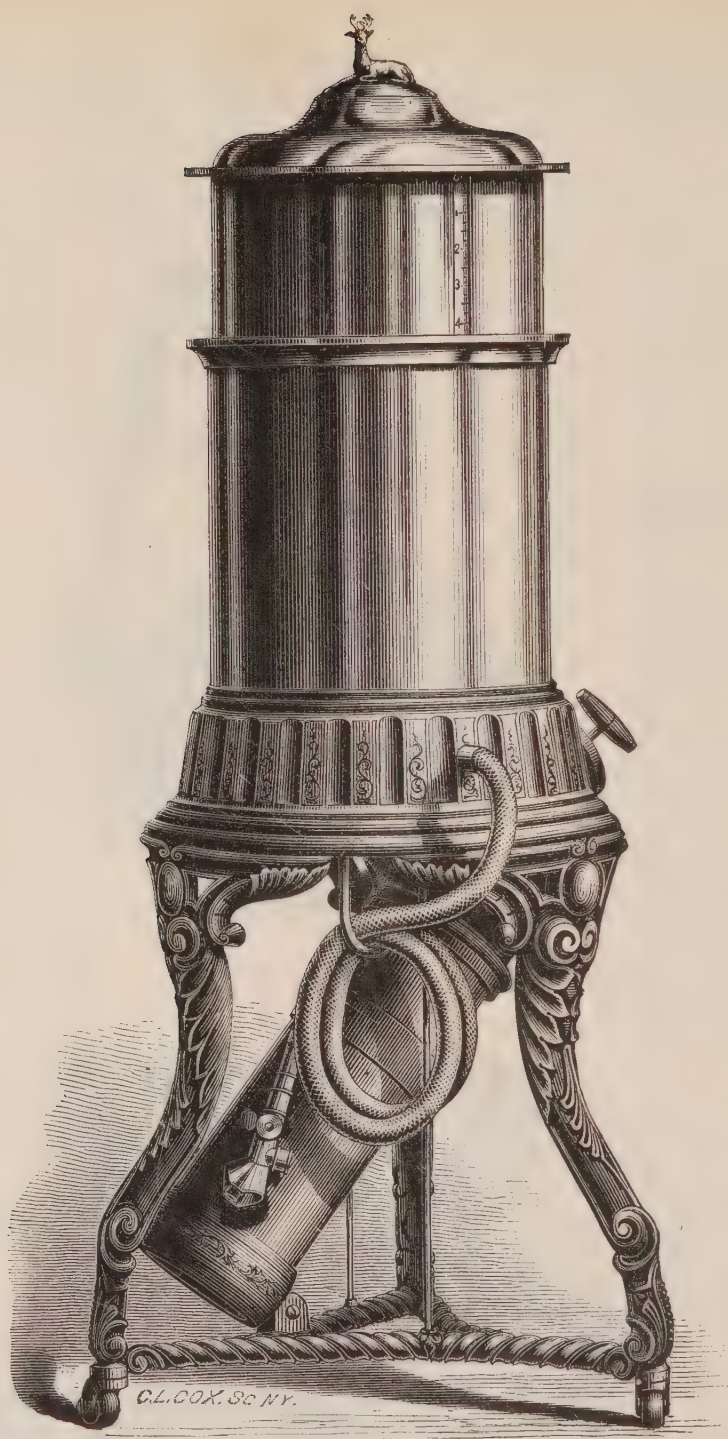
Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers



SURGEON'S CASE.

without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



NICKEL-PLATED GASOMETER

AND ORNAMENTED STAND

FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas—this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality*.

JOHNSTON BROS., 812 Broadway, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler.....**No. 1**....\$42 00

Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic

Inhaler.....**No. 2**.... 45 00

Boxing either, \$1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas..... 16 00

Refilling Cylinder..... 6 00

Nickel-Plated Gasometer, with ornamented iron stand.....128 00

Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered

Tubing)..... 12 00

1000 Gallon Cylinder..... 36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of $4\frac{1}{2}$ cents per gallon, which is 25 per cent, less than the price in small cylinders.

Contents, if 1000 gallons, would be, at $4\frac{1}{2}$ cents..... 45 00

Morocco covered case, with ring and thumb screw, velvet lined..... 12 00

Polished bl'k walnut “ “ “ “ “ “..... 13 00

Of these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity) 5 00

Rubber Bag, with covered inhaler tubing, extra size..... 7 00

Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection..... 9 50

Key, Nickel Plated..... 1 50

Wrench, “ “..... 50

Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag..... 1 50

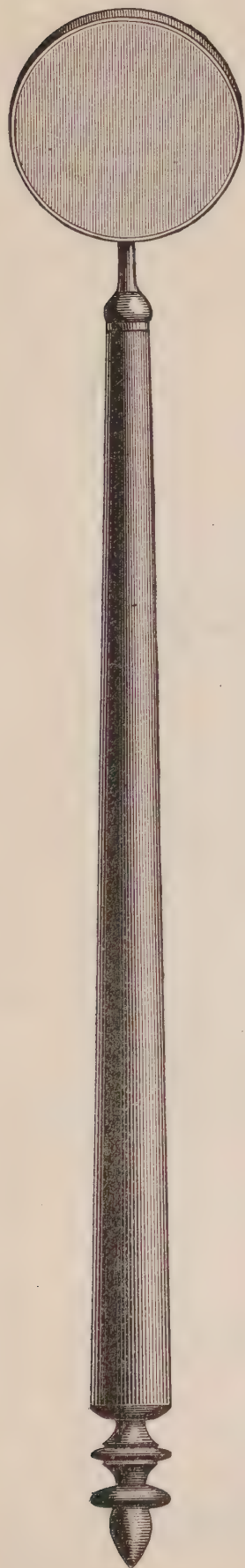
Covered Inhaler Tubing, per foot..... 50

Plated Connection to fit old style Inhaler..... 1 00

JOHNSTON BROS.,

812 Broadway, N. Y.

MOUTH MIRRORS.



Our own make—thoroughly tested. They are first heavily coated with silver, then protected carefully by a deposit of copper, as are the imported glasses known as “the imperishable,” then mounted in a nickel-plated frame.

PRICES.

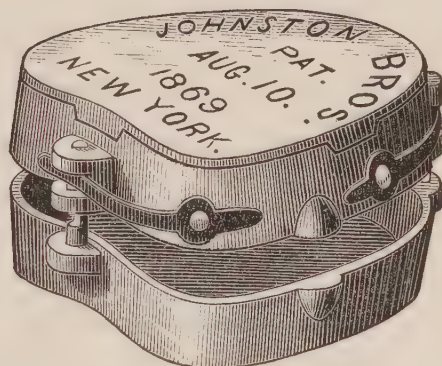
Plain, with ebony handles, $\frac{1}{2}$ to 1 in. diam.	\$1.00
Magnifying, “ “ “ “	2.00
Plain, with ivory “ “ “ “	2.50
Magnifying, “ “ “ “	3.00

JOHNSTON BROS.,

812 Broadway, N. Y.

SELF-LOCKING FLASK.

(PATENTED.)



This flask has been long tested with celluloid in actual use. It may also prove useful in rubber work, in which case it should be closed before being put into the vulcanizer.

POINTS OF MERIT:

1st. By its use one obviates the necessity of waiting to cool his heater before proceeding with a second case, since, when the flask is once closed, it locks itself, the screw may be loosened up, and the case and can be immediately removed from the heater.

2nd. The click made by the spring as it drops into its socket announces that the flask is closed and the piece cured.

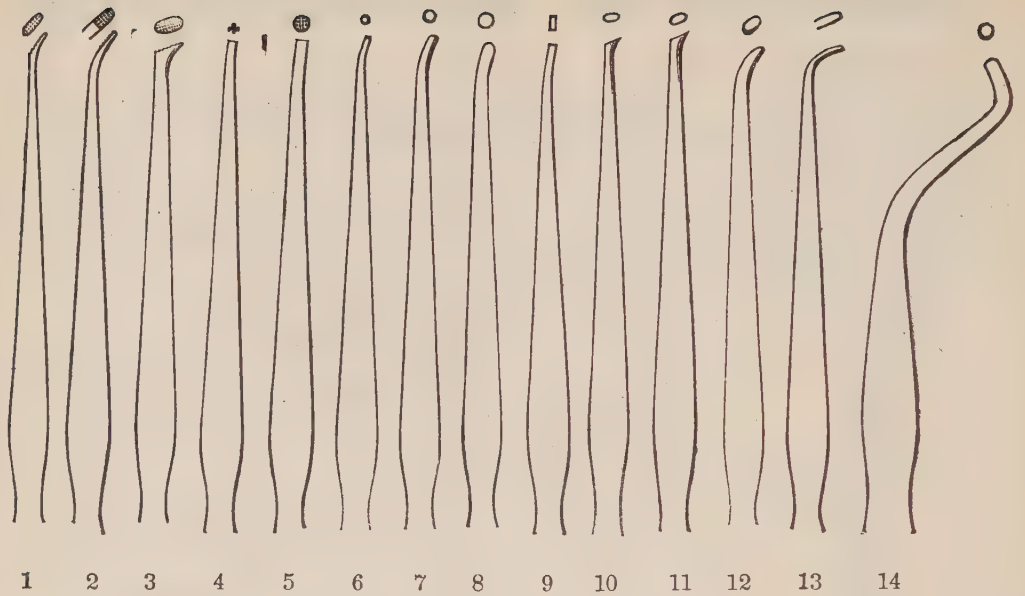
3d. This feature secures the dentist against the carelessness of an assistant, as should the flask fail to close, the fact could not escape his attention.

PRICE.

Brass\$2.50

JOHNSTON BROS.,

812 Broadway, N. Y.



Brockway Pluggers.

The points of this unique set of instruments are pictured above.

The set embraces finely serrated as well as smooth points, which latter form predominate. A peculiar feature of the set is, that only points of the same kind have handles alike in shape or color, and even each of these has some mark by which it can be distinguished from its fellows of the same style but of a different size. Instruments of each shape have a handle peculiar to that shape, so that the operator can, at a glance, recognize the particular instrument he may want.

Care has been taken to adapt the weight of each handle to the size of the point ; also in every form of instrument to avoid all sharp angles, which might cut the gold.

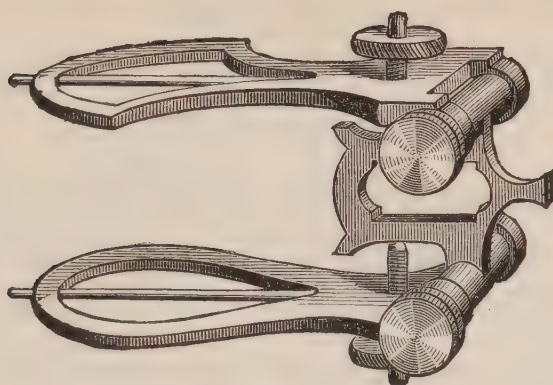
PRICES.

Per Set.....	\$12 00
Nos. 1, 2, 3 and 14.....	Each 1 15
Nos. 10, 11, 13.....	" 90
Nos. 4, 5, 6, 7, 8, 9 and 12.....	" 70

JOHNSTON BROTHERS,

* 812 Broadway, N. Y.

ELLIOTT ARTICULATOR.



Price \$3.00.

Points of Merit in the Elliott Articulator:

By W. S. ELLIOTT, D.D.S., M.D.S

- 1st. Mechanical simplicity.
- 2nd. Impossibility of disarrangement of *bite*.
- 3d. Easy adaptation to all cases.

To use it observe the following DIRECTIONS: Next after the bite has been taken, turn the jaws of the Articulator each upon the other, forward or backward, according as you have a close or wide articulation, at the same time turn the set screws back so that they will be entirely free, when it will be observed that either jaw can be thrown *endwise*, forward or backward at pleasure. Set the cast upon either jaw and adjust the other to the most desirable position. Secure with a very little plaster; when *set* turn down the screws until they touch the inner frame. The entire arrangement is now firm and immovable, except the *open and shut*.

Trim the plaster closely and neatly to the jaws. If it is desired to remove the model, seize the projecting end of the central steel wire, withdraw it, when the model can be removed with ease.

JOHNSTON BROS.,

812 Broadway, N. Y.

ENGLISH PINK RUBBER.

We offer 1 x <i>pink</i>	\$8.00 per lb.
I	8.00 "
White.....	6.50 "
Black.....	3.50 "

JOHNSTON BROS., 812 Broadway, N. Y.

FLOSS SILK.

We offer a fresh lot of unsurpassed quality as regards strength, uniformity and fineness of fibre. Each spool contains twelve yards.

Price per spool.....	.15
Price per dozen.....	.\$1.50

JOHNSTON BROS, 812 Broadway, N. Y.

NEW YORK COLLEGE OF DENTISTRY,

1876-77.

FACULTY.

FANEUIL D. WEISSE, M.D., Professor of Regional Anatomy and General Pathology.

FRANK ABBOTT, M.D., Professor of Operative Dentistry and Oral Surgery.

ALEX. W. STEIN, M.D., Professor of Histology, Visceral Anatomy and Physiology.

F. LEROY SATTERLEE, M.D., Ph.D., Professor of Chemistry, Materia Medica and Therapeutics.

C. A. MARVIN, D.D.S., Professor of Mechanical Dentistry.

WILLIAM H. ALLEN, Clinical Professor of Operative Dentistry.

JOHN ALLEN, D.D.S., Clinical Professor of Mechanical Dentistry.

JOHN T. METCALF, Clinical Professor of Operative Dentistry.

WM. T. LAROCHE, D.D.S., Clinical Professor of Operative Dentistry.

WM. B. HURD, D.D.S., Clinical Professor of Operative Dentistry.

J. BOND LITTIG, D.D.S., Clinical Professor of Mechanical Dentistry.

D. W. WILLIAMSON, D.D.S., Demonstrator of Operative Dentistry.

A. RUST CUYLER, D.D.S., Demonstrator of Mechanical Dentistry.

C. P. KREIZER, M.D., Assistant to the Professor of Chemistry, Materia Medica and Therapeutics.

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Monday, October 4th, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

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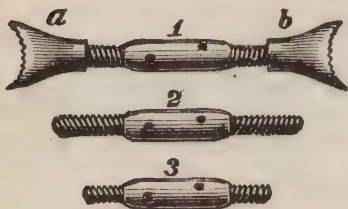
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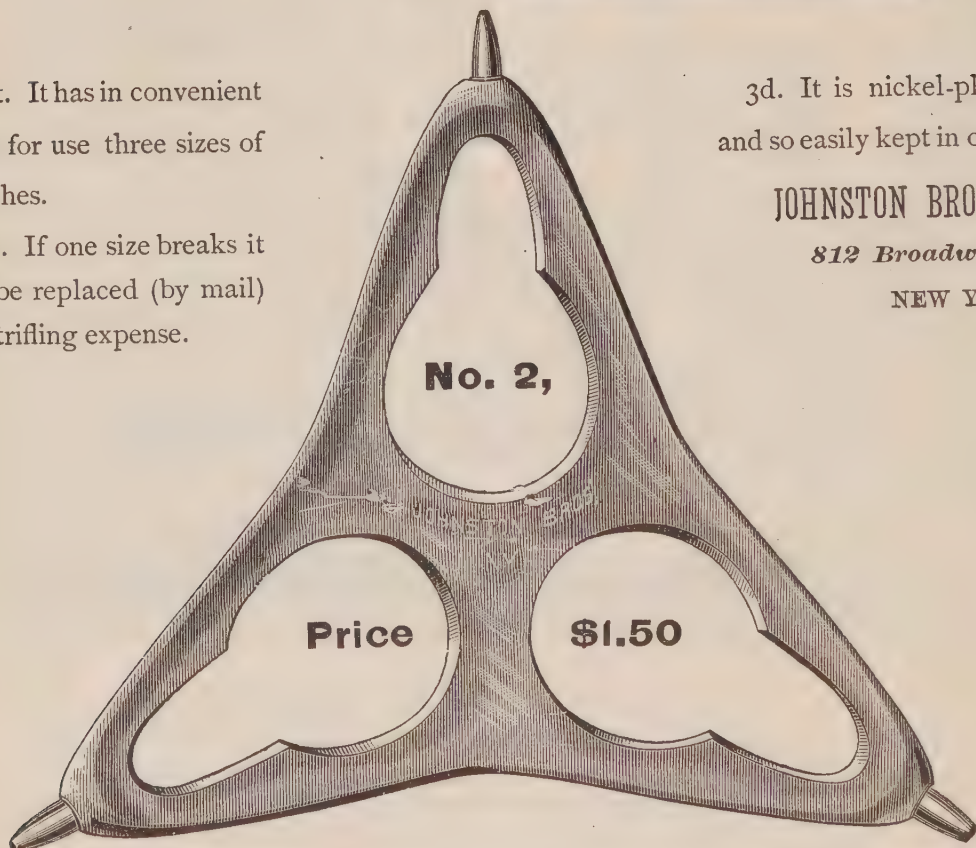


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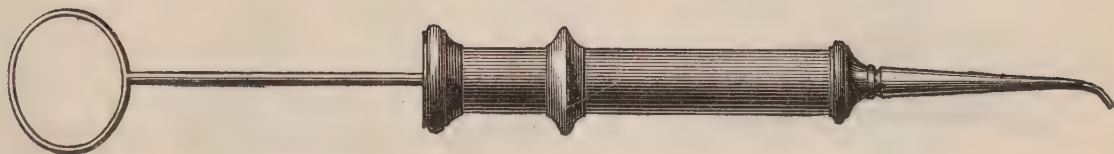


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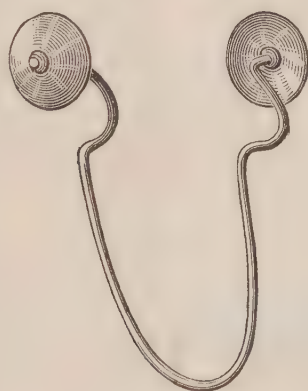
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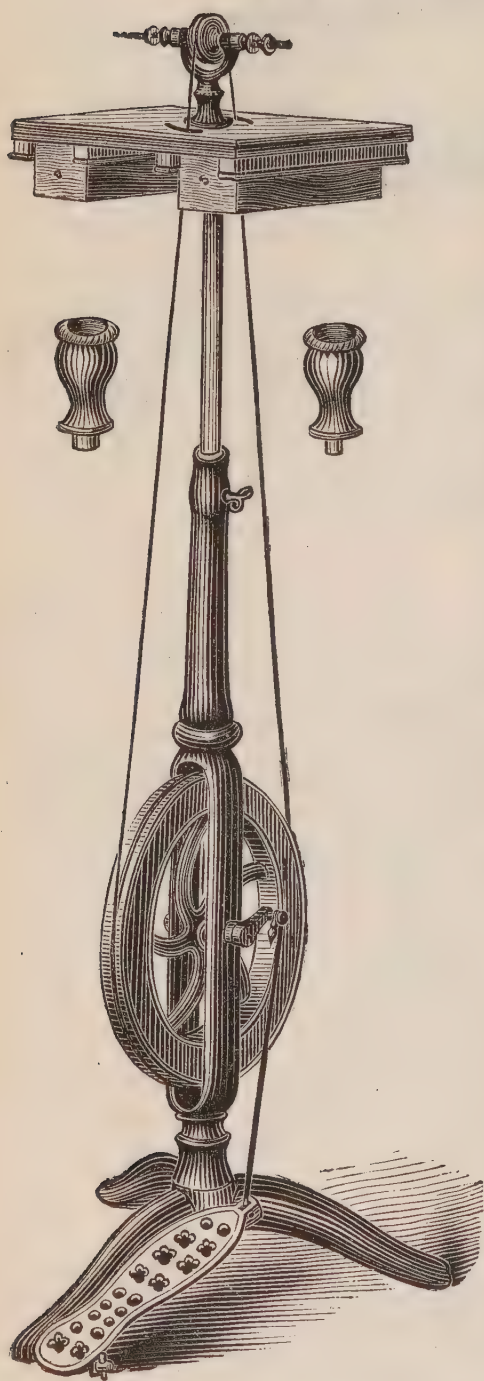
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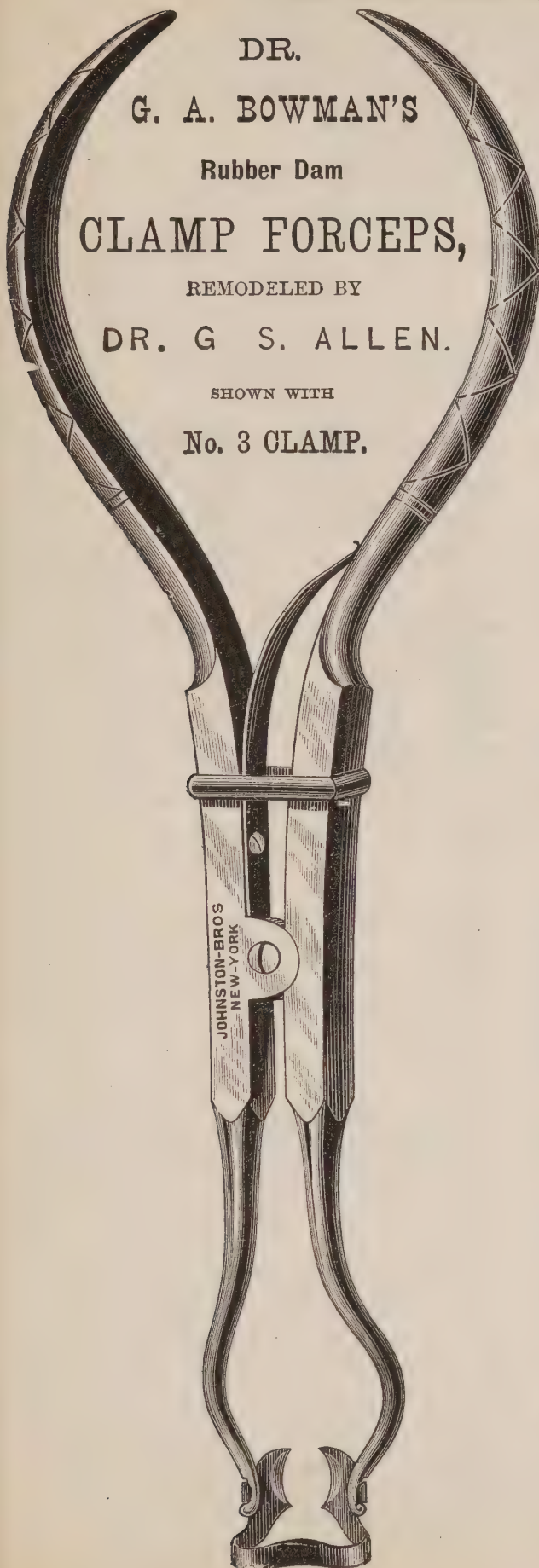
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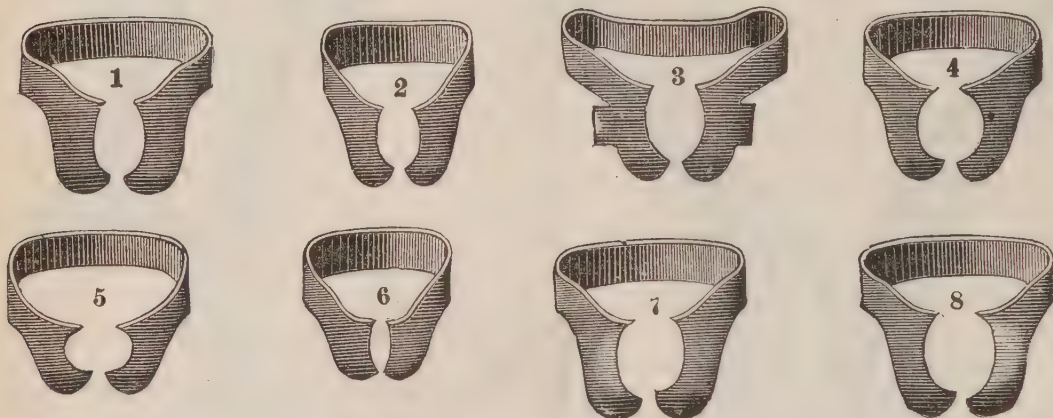
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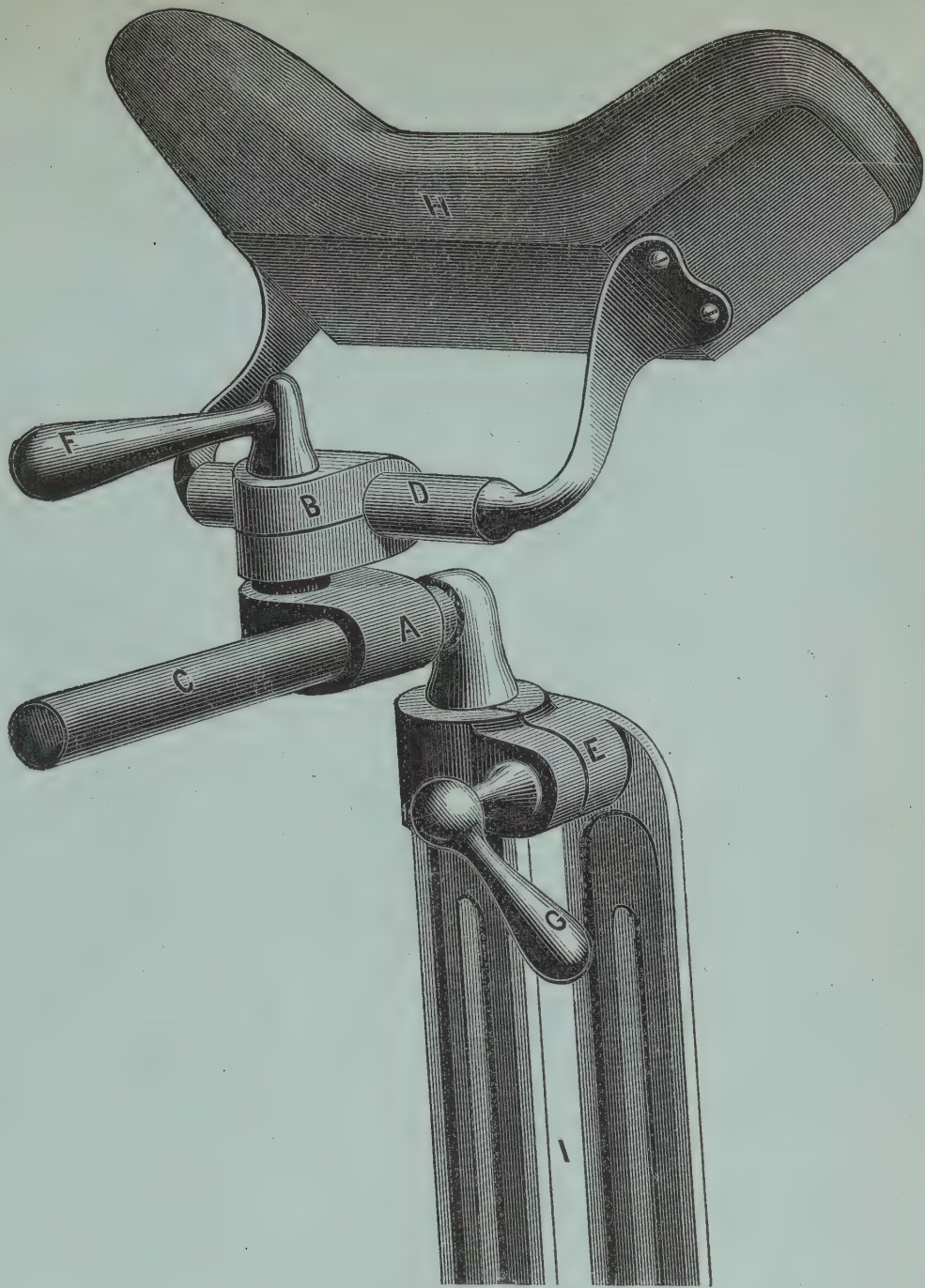
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A NEW MONTHLY JOURNAL

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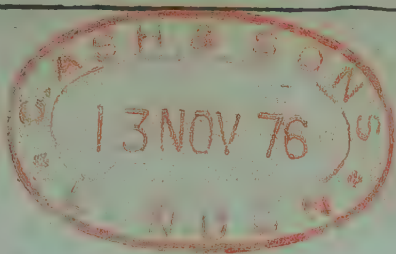
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VOL. 3.

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OCTOBER, 1876.

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JOHNSTON'S

DENTAL MISCELLANY,

FOR 1875.

It is certainly reasonable cause of self-congratulation on the part of the publishers of this Journal, that the end of the first year of its publication finds it with a large and constantly increasing list of subscribers, and that they are constantly in receipt of letters of encouragement and commendation from their readers in every section of the country, and even from distant portions of the world, one such letter being recently received from Japan.

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JOHNSTONS'

Dental Miscellany.

VOL. III.—OCTOBER, 1876.—No. 34.

DENTAL ARCHITECTURE.

By HORACE DEAN, D.D.S.

Of the many thousands of articles contributed to the dental journals during the years that dentistry has had a literature, less than a score have in any way treated of the rooms in which the life work of the dentist is done. This might seem to imply that it is a subject of slight importance; but when it is remembered that the most of the active hours of the dentist is spent in his rooms, it will at once be realized that the character of those rooms, as regards location and arrangement, is of the utmost importance.

Unfortunately for our profession, we require an arrangement of rooms different from all others, and houses are not readily found which will even indifferently give us the accommodation which we need. Consequently, if we wish to be comfortably, conveniently and appropriately housed, we must build for ourselves. But he that builds hastily, or without due consideration, builds foolishly. Therefore, before the plan is drawn or even the lot selected, the builder should know what manner of house he wants, and why he wants it thus, and having thus settled the underlying principles which govern his actions in the case, he can go forward and build what will prove to be a home for his practice and his family. In this article I shall make a declaration of my principles on this subject, trusting that those who read them will be moved to do likewise, and so the subject will receive the attention which it deserves. We will consider:

First. Location as regards *surroundings*. A lot should be chosen, if in

a moderate sized town, just in the verge of the business section, and yet quite retired from business and where business will not be likely to crowd it for years to come. It should be in the most respectable portion of the town, for the dental practitioner is judged somewhat by his surroundings outside as well as inside his office. If in a city, locate where are the most homes of the class desired for patients.

Second. Location as regards *sunshine*. The view is often advanced that the north is the best light for operating, and undoubtedly it is more steady. But the dentist, of all professional men, should make his office a pleasant, healthful room.

The conditions of dental life and work are exhaustive of physical and nerve force, and a full practice prevents the proper amount of exercise in the open, sunshiny air which is needed to restore ; therefore the next best is in order: place your operating room where the sun will shine into it as many hours of the day as possible. A little ingenuity will so arrange white, or tinted, or darker curtains as to exclude direct sun rays, which would interfere with operating.

Third. Location of dental rooms as regards the *rest of the house*. And here are a number of points to be thought of. 1st. Although it is eminently respectable, and altogether best, that the home and office should be under one roof, yet the home should not intrude upon the office. Patients have certain rights which the thoughtful dentist will respect, and one of these is that they should not be compelled to hear or see the inner working of the dentist's family concerns, unless they so desire, in which case a friendly call on him will be all-sufficient. The incursion of children in varied conditions as to dress and cleanliness, to say nothing of manners, into the waiting room, is to many fastidious patients a great annoyance. A patient will sometimes under stress of great pain or fear act excitedly or perhaps foolishly, but if only the operator see or hear, it is not so bad ; but if a troop of children, or other members of the family, are discovered taking notes, offense may be taken and a patient lost.

On the other hand, neither should the office intrude upon the home. "Accidents will happen in the best regulated families," but it is not best that said accidents should happen in the sight or hearing of the unsympathetic, and often critical, frequenters of the office. Children should not be exposed to the indiscriminate flattery and questioning of the waiting room. It is not possible or even desirable to keep children always ready for exhibition to strangers, but where the proper home privacy is not had, they may be put on exhibition at most inopport-

tune moments. It is better, therefore, that a separate entrance and a distinct suite of rooms be provided for the practice. 2d. The home should not occupy the best rooms in the house, and crowd the practice by which the home exists into rooms which are not convenient or healthful. Neither should the practice monopolize unduly, and force the family, as is often the case, to take the top and bottom of the house, and so cause a great deal of stair-climbing with its attendant evils.

Fourth. Arrangement of the dental rooms. The suite of dental rooms should consist of, 1st. A waiting room, or parlor, in which no operations should ever be performed, or any evidences of dentistry be seen. Convenient to this should be, 2d. The operating room. This room should so communicate with the first, that the patient occupying it need not be exposed to observation. A bay window of three or four feet projection and a glass roof will give the necessary light and sunshine. In addition to these two, there should be, 3d. A room to be used as

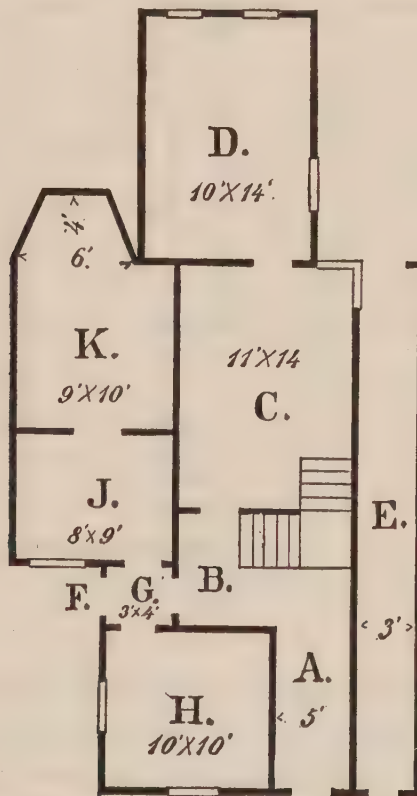


Fig 1.—First Floor. A, Front Entrance for Family; B, Hall with Stairs; C, Dining-Room; D, Kitchen; E, Alley; F, Entrance to Dental-Rooms; G, Lobby; H, Patient's Reception-Room; J, Auxiliary Office; K, Operating-Room.

an auxiliary office. Oftentimes the operator is in the midst of an interesting case, dam adjusted and everything fixed just right, when in comes another patient requiring but a few minutes' attention. It is not pleasant or just to keep such a one waiting for an hour or two, nor yet

to disturb the patient in the chair ; but with the extra room, all is easily and promptly managed. It should also be used for extracting, and for artificial work, where such is done, and so avoid interfering with the niceties of the operating chair and table. This room, chamber of horrors, should have the walls deadened and the doors sound proof. Many a timid one, with a stock of courage only sufficient for the necessities of the desired operation, has found hope and strength depart, driven away by the sights or sounds experienced during the proverbial "few minutes" of waiting. This room, as well as the operating room proper, should have an independent door to the exit hall. If possible to prevent it, no patient, after an operation, especially if they have been demonstrative, should be compelled to pass through a room occupied by others.

Fifth. The rest of the house. In a moderate sized house when these three rooms have been taken, some skill in planning must be exercised to give

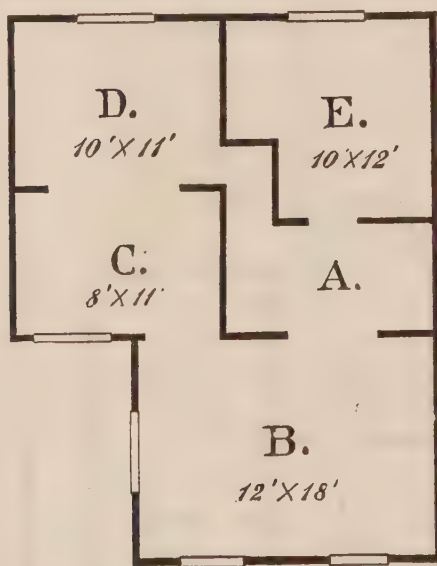


Fig 2.—Second Floor. A, Hall; B, Living-Room; C, Sewing-Room; D, Reception-Room; E, Bed-Room.

the home its due share of comfortable accommodation. But if two things are avoided, basements and a large parlor, all will be well. Basements are seldom healthful, and necessitate climbing an extra flight of stairs. A large parlor, kept for company calls, is an expensive, unsatisfactory room. Necessarily stiff and formal, with scarce a touch of home about it, it really does not pay for the cost of time and money which it entails. It is usually the most pleasantly situated room in the house, but the least used. Better take it for the home room and receive *friends* there ; and if some callers are too stylish to be friends, have a *small* room that can easily be spared, and furnish that as

stiffly and fashionably as means will allow, and use that for callers of that ilk ; but do not make the parlor the principal room, to the exclusion of home comfort and convenience.

So much for the principles. If the reader will now examine the plans, the practical working will be seen. Having had no training in plan drawing, I claim for these no merit, but present them simply as illustrations of the foregoing principles.

The second story is intended to project over the alley and be supported either by posts or a wall. The rooms, B, C, and D., second floor, could connect by large doors, and so make a large room for social gatherings. The third story will supply the necessary bedrooms, bathroom, etc.

If the lot should be fifty feet front, the house could be two stories, with all the home rooms, excepting bedrooms and bath, on the first floor, and a one story extension for the dental rooms.

CASE OF PYÆMIA FOLLOWING DENTAL CARIES.

By DR. JAMES F. GOODHEART.

Dental caries—abscess—suppuration in the inferior dental canal—acute periostitis of the lower jaw—extension of the inflammation along the pterygo-maxillary fossa to the orbit—suppuration in both orbits, and osteitis of the vault of the skull—pyæmia. Such is a short summary of this interesting case. Its publication needs no explanation or apology, for such a result from such a cause is probably unknown. I am indebted to my colleague, Mr. Howse, for his ready permission that it should be published.

M. C. W., aged four years and a half, was admitted to Guy's Hospital, under the care of Mr. Howse, on September 30th, 1874.

The family history was good, except that there was some account of a tumor in the grandmother. The child had been a healthy boy till six weeks before his admission, when he came home from school with a bad attack of diarrhœa. A few days subsequently he was much frightened by a fire, and it was within a short time of this that his left eye was noticed to swell. In a fortnight the other eye did the same, but no notice was taken of it. He gradually got worse, and for three weeks prior to admission he was in a drowsy state.

On admission, he was delicate and vacant-looking. The left eye was

much more prominent than the right, with thickening along the upper margin of the orbit. Beneath the edge, under the eyelid, was a hard, cartilaginous, freely-movable body, which reached backwards apparently into the orbital cavity above the eyeball, while it extended downwards into the eyelid. The movements of the eyeballs were perfect, and sight was unaffected. The temperature was 104.5° in the morning, and 102.7° in the evening; pulse 160.

He was seen by Dr. Fagge, who could discover no cause for the elevation of temperature. Dr. Fagge thought, however, that as the roof of each orbit was evidently affected, and the boy tottered as he walked, and was peculiarly torpid, the disease, whatever it was, had extended from the orbital fossæ to the cerebral hemisphere. The ophthalmoscope revealed only large and tortuous veins, with a small hemorrhage on the outer margin of the right optic disc. The temperature remained high, and he rapidly became much worse, losing control over his evacuations, and he died nine days after admission.

Autopsy.—The eyeballs were hardly prominent now; but the left upper lid was full, and a hard, movable mass could be felt along the orbital ridge. The scalp was normal; and nothing wrong was noticed till, on the removal of the vault of the skull, the dura mater in its frontal part and the longitudinal sinus for half its length were rough and of an olive-green color from purulent infiltration of the membrane. The corresponding inner surface of the skull was of the same greenish tint and rough all over, partly from the deposition of a layer of new bone; partly from an irregularly excavating caries. Confining the description still to the bones of the skull, nothing further was noticed till the roof of each orbit had been removed, and then a thick layer of similar green-colored pus was exposed, lying, of course, between the bone and the orbital periosteum. The orbital cavities (muscles, etc.) were quite healthy. On the right side the pus extended all over the outer side forwards, and appeared externally over the superciliary ridge, while it passed backwards through the optic foramen and sphenoidal fissure *underneath* the cavernous sinus, across the sella turcica and groove for the optic commissure, through the right optic foramen and right sphenoidal fissure—all this *beneath* the dura mater of the base of the skull, the bone itself being rough and carious, and part of the body of the sphenoid infiltrated with a grumous, chocolate-colored pus. Thus it appeared the right orbit had become affected after the left. On the outer side of the left orbit pus was traced into the speno-maxillary fossa, and thence to the condyle of the lower jaw. The articulation

was free, but the whole of the condyle and much of the ascending ramus on this side was bared of its periosteum, and pus lined the inferior dental canal as far as the first molar tooth, which was decayed, lying loose in its socket, and with carious bone about it. It should also be said that, though the pus so closely surrounded the cavernous sinus on each side, yet these sinuses were quite unobstructed. So, also, was the longitudinal sinus, though its walls were very much thickened. The frontal sinuses were normal. The lump felt during life over the left superciliary ridge consisted of a tough, opaque yellow mass, very much like some lymphomata as seen in the neck, or like a gummatous mass. It certainly had all the microscopic appearances of some new growth, but after further examination it was evidently of an inflammatory nature. Its precise situation was from the lachrymal gland externally to the inner margin of the orbital ring, and it lay half protruding from and half within the orbit, and adherent to the bone, which on its removal was bare of periosteum.

The brain weighed forty-eight ounces, and lymph was found at its base, and a dot or two of pus was found beneath the arachnoid on the left side, about an inch from the longitudinal fissure. None of the veins contained any coagula. The brain was exceedingly soft, and the number of small cavities formed by softened substance scattered throughout it was remarkable. The whole brain, cerebrum and cerebellum, was studded. Most of them were small—mere pin-points—but one or two were larger; and they had this peculiarity—that their walls were sufficiently well defined and hard to show that they were not formed by a general softening of the brain, more advanced at some parts than others, but that they were really due to numberless local spots of disease, very probably embolic. Ecchymoses were found in the retinae, on the pleuræ, and in the substance of the lungs, heart and kidneys; and no emboli could be found in the vessels. The lungs contained early pyæmic infarcts, and there were early abscesses in the heart and kidneys.

Remarks.—There can be no doubt from the post mortem appearances that the source of all this mischief was a decayed tooth. It had led to caries of the bone, to suppuration in the inferior dental canal, and thence the pus had followed the course which has been described. The case is one, perhaps, rather curious than instructive, though as a record of a bare possibility it is worth remembering. It is a good illustration of the bad results which may follow a slight amount of mischief in an unhealthy subject, and is remarkable in that there is no history of any toothache, swelling or other trouble about the jaws. Excepting a bad

attack of diarrhœa, the first symptom noticed was swelling, first of one eye, and then of the other. Notwithstanding that by the time the second eye was affected, as shown by the inspection, there must have been considerable suppuration at the base of the skull, about the pituitary fossa, and very probably about the vault also, the disease at its onset must have been peculiarly insidious, and the pyæmia of late accession, within a few days of his admission. The case has several points of pathological interest; chief of these seems to be the occurrence of chronic inflammatory tumors, such as those in the orbital fossæ, and not abscesses, though they were directly continuous with the suppurating surfaces of the base and vault of the skull. Pus so commonly begets pus. It is not, however, always so. One occasionally finds in the lung, in cases of pyæmia of somewhat more chronic form than usual, indurated spots of chronic inflammation evidently produced in the same way as the, it may be quite adjacent, abscesses. In one instance, in a very chronic case of pyæmia after amputation of the leg, the extension of gray tubercle round the central inflammation was seen. Such cases depend upon some peculiarity in the infective material, or upon defective reaction on the part of the infected tissue, which in turn must, of course, depend upon the state of the body as a whole. Experiments on animals have shown that by varying the strength of the infecting agent, the form—or, perhaps more correctly, the degree—of cell-growth can be made to vary from abscess to tubercle. In this case, however, it was probably no dilution of the poison which led to the orbital tumors; but the whole history shows that the infected tissues were most tolerant, and not easily excited. Had it been otherwise it would have been impossible that such an amount of disease could have existed. In the case of chronic pyæmia just referred to the patient had lost so much blood from a uterine fibroid tumor that her leg became gangrenous from the extreme feebleness of the outlying parts of the circulation, and weeks after the amputation which this condition necessitated she died. Is this not always so in chronic pyæmia? It occurs in enfeebled patients whose tissues are in so quiet a state—*i. e.*, so accurately supplied with just the requisite amount of nutriment and energy—that they can hold their own, and no more. In such a condition, where is the blood to produce inflammatory congestions? and the tissue elements have not got it in them to multiply and make mischief. So the wandering cells are few in number; they meet with no response in the lawless excursions and indurations, and organizing products result in place of abscesses. The

practical point which such cases teach is this—that chronic pyæmia is one stage nearer no pyæmia at all than the local outburst in the more rapidly fatal forms. If it is chronic because, as has been said, supply and demand happen to be adjusted for maintenance only, and not for growth, how pertinent in its suggestions is the process on the treatment of inflammation in general! But, as if to contradict what has been said with regard to the relation between the orbital swellings and the pus elsewhere, the patient in question ultimately died with high fever, and apparently acute pyæmia. Well, “the worm will turn,” it is said, and possibly some very fetid change may have occurred in the dental abscess, and thence have been propagated to other parts in the last few days of life. Such a view is quite in accord with the bacterial origin of pyæmia, which obtains so much credit at present. This much, however, seems certain—that the local inflammations which caused the patient’s death, and those which were noticed first some time before death, were of different dates. Between the two the condition of the patient had been altered, both as to his surroundings and his diet, and quite possibly, though advantageously to the vigor of his tissues individually, not altogether to the continuance of life, so far as it was threatened by pyæmia. The logical conclusion of these thoughts is not, as some may think, that patients suffering from any of the various inflammatory diseases are to be starved and bled, and reduced to the lowest possible ebb. They only suggest caution. It is possible to do too much. Pyæmic cases, for instance, particularly, are often stuffed merely by routine. Is it always good for such cases that they should be so? It is probable that Sir James Paget’s advice with regard to reduced supplies in carbuncle might with advantage be applied to many other forms of disease, both in medical and surgical practice.—*Monthly Review of Dental Surgery*.

AMERICAN DENTAL ASSOCIATION.

MEETING OF AUGUST, 1876.

(*Continued Report of Afternoon Session of First Day, August 2d.*)

In addition to the comments by Dr. Atkinson:

Dr. J. M. McQuillen’s report of the Committee on Physiology elicited remarks from Drs. Shepard, of Boston, and Dr. C. N. Pierce, of Philadelphia, each instancing cases of the premature eruption and development of the temporary teeth in young children. Concerning the absorption

of the roots of temporary teeth and the effect of the presence of the permanent teeth upon such absorption there was considerable discussion, participated in by Drs. Francis and Atkinson and Abbott, of New York; Dr. Morgan, of Nashville, Tenn.; Drs. Kingsbury and Flagg, of Philadelphia, and Dr. Chas. Butler, of Cleveland, Ohio. Dr. Francis said: We cannot positively assert that absorption is caused by pressure, but we observe that when a tooth impinges upon a root, we find portions of the root absorbed. If the permanent tooth takes a direct course we find parts of the deciduous tooth absorbed. Sometimes the permanent tooth takes its place by the side of the temporary and there is no absorption of the root. The presence of the temporary tooth, however, seems to have something to do with absorption when it occurs.

Dr. Morgan said: Absorption is a chemical action, and that is as impossible in a dead tooth as in a dead man. Pressure is necessary to absorption of the root. The difference of eruption noted in different countries is worthy of note. It may be due to climate. There is a more rapid development as we approach the equator. He has seen twenty-eight permanent teeth at eight years of age.

Dr. Abbott said he had seen a case of the eruption of twenty-eight permanent teeth at eight years. He thought that absorption, instead of being due to pressure, was the result of a physiological irritation sufficient to cause a taking up of material; he did not believe that the material so taken up was reassimilated; he had never seen pressure on the end of the root sufficient to destroy the pulp.

Dr. Kingsbury: Absorption never takes place after devitalization, although some think it does; the presence of a carneous tissue is necessary. The existence of the permanent tooth does bear an important relation to the process, as is proved by the fact that when the germs of the permanent teeth are wanting the temporary ones remain. We sometimes find partial absorption without eruption of the permanent teeth, but that is the exception; absorption is a vital process.

Dr. Flagg said he supposed that was settled twenty-five years ago. The carneous body is concomitant with absorption; it tends to permit it. Absorption changes into disintegration after devitalization; a breaking-down is not absorption. Roots disintegrate very little after devitalization; they are shot out, driven out by pressure, and there is no carneous body there; it is a sort of exfoliation, not exactly like that of bone, but like that action which pushes an artificial set out of its place when a wisdom-tooth erupts under it. There is sometimes a non-absorption of the roots of the temporary cuspids, and a serious mistake is not

infrequently made in extracting them, the permanent failing to appear. The temporary cuspids should always be maintained till they are loose; if extracted when swelling of the gums takes place, it may be five, ten or fifteen years before the permanent teeth make their appearance.

On motion of Dr. Buckingham a committee of three was appointed to take action relative to the death of Prof. Wildman, and Profs. Buckingham, Taft and Chandler were appointed such committee, and offered the following resolutions, which were unanimously adopted:

Whereas, In the midst of life we are in death, yet in our profound sorrow we bow in meek submission to the mysterious dispensation of Him who doeth all things well; and,

Whereas, In the sudden and unexpected death of that esteemed and valued member of our profession, Dr. Elias Wildman, we have lost a most valuable member—one by whose untiring labor for the last forty years the profession has been incalculably benefited—who, as an investigator and teacher, stood in the very front ranks, and whose discoveries and contributions will endure as long as the profession exists; therefore be it

Resolved, That we mourn the loss of our departed brother, the evidence of whose labor and ability and good works were seen every day; that as his professional career was one of constant labor for our benefit, so his private life was pure and unspotted, exhibiting a rare combination of those virtues which constitute the true man and good citizen; that although the place which has known him shall know him no more, yet his name shall not be lost, for it is imperishably written in his works.

Resolved, That we tender to the family and friends the condolence and sympathy of this Association, and that these resolutions be entered upon the minutes, and upon the memorial page in the Transactions.

The next subject taken up was that of "Pathology," and the discussion was commenced by Dr. J. Foster Flagg, of Philadelphia, from the committee. He said he had been working hard in the direction of dental pathology during the past fifteen or eighteen years. So much discrepancy still exists that the best men are found on the floors arrayed as foes. All the workers still should work and some means be devised to guard against the danger of losingsight of truth in sight of self. He thought it advisable that those analogies to committees, called sections, should be organized, and all the pathological differences should be reconciled.

Dr. Hunt, of Washington, moved that that portion of the report rela-

tive to the organization of sections be referred to a committee of three, to report the present session as to its expediency. Adopted.

A few remarks on the subject of "Pathology" were made by Dr. W. H. Atkinson, of New York.

On motion of Dr. Shepard the election of officers for the ensuing year and the selection of the next place of meeting was made the special order for to-morrow morning at eight o'clock.

The Committee on Credentials presented an additional report, after which the association adjourned until 8 P. M.

The committee, consisting of Drs. Hunt, Atkinson and Morgan, subsequently reported that they were unanimously in favor of such action, but that there was not time to properly consider the subject at this session, and they therefore asked that they should be continued, and allowed to report at the next meeting.

The committee, moved by Dr. Hunt, was appointed to consist of Drs. R. F. Hunt, W. H. Atkinson and W. H. Morgan, who afterwards requested, in view of the importance of the subject, they be permitted to report at the next annual meeting—which request was granted.

EVENING SESSION.

The Association re-assembled at eight P. M.

A paper of Dr. W. N. Morrison, of St. Louis, on "Dental Pathology and Surgery," was read. It gave an account of an operation for the excision of the inferior dental nerves.

Being called upon for a loan of instruments by a surgeon of St. Louis, to enable him to perform such an operation, the writer suggested that the old operation was unnecessarily formidable, and that with the dental engine it could be done much better, and leave no wound. Drills were made for the purpose—one a flat and the other a bur-drill—that would drill holes about one-fourth of an inch in diameter. The patient was a lady about seventy years of age, who had suffered with intense neuralgic pains for twelve years. A hole was drilled corresponding to where the third molar stood, and carried downward and outward till the inferior dental nerve-canal was reached, when it was enlarged by the bur, and as much of the nerve destroyed as could be by moving the bur back and forth in the canal fully half an inch. In cases where it is desirable to move more than this, it might easily be done by drilling another hole at the proper distance forward, and removing the section of intervening nerve with a hook-shaped instrument. This opera-

tion can thus be performed through an opening not larger than that resulting from the extraction of a bicuspid. In this case relief was afforded, as well as in a number of similar ones. The dentist is rarely called upon to treat such cases, though he is better qualified than the surgeon to perform this operation.

The paper was discussed by Dr. Shepard, of Boston, Dr. Barker, of Philadelphia, Dr. Flagg, of Philadelphia, Dr. John Allen, of New York, Dr. Rehwinkel, of Chillicothe, Ohio, Dr. Knapp, of Indiana, Dr. Abbott, of New York, and Dr. Stellwagen, of Philadelphia.

The last-named gentleman said that north-east winds and a falling barometer had a deleterious effect upon the higher class of dental operations in this country. The health of the teeth is very much dependent on the health of the general body.

Dr. Morgan, of Nashville, Tenn., said that June was the worst month in the whole year for toothache. The warm weather, with a very moist atmosphere, was found to be most debilitating in his State.

Dr. Barker, of Philadelphia, said the credit should be given to the change the person makes in his habits, and not to the weather. He did not consider that, *per se*, the changes in the temperature induced it. The organ that responds to overwork is the brain. He contended that in typhoid fever a physician could give medicine that would produce decay in the teeth. As a sequence of typhoid fever decay results. He knew the value of alcohol in typhoid fever, as his life had been saved by it.

Dr. Flagg said that he had tables extending over fifteen years of time. March has three times, and November twice as much toothache as other months. In March they came into the hundreds. He was glad to say that the teeth filled in the canals with cotton stood the test nobly at such times. Patients who die of consumption and typhoid fever have trouble with their teeth. Those organs and the hair show the state of the system before the patient is brought to his death-bed. Medicines do not decay the teeth. Alcohol should be kept on the outside.

Dr. Taft, of Cincinnati, said he had kept for the last four or five years an aquarium in his office, and on several occasions some of the fish were killed after a thunder storm. One thing overlooked were the peculiarities dependent upon locality.

Remarks were made by Dr. Bogue, of New York, and Dr. McQuillen, of Philadelphia. The latter alluded to the burning of oyster shells at the gas-works, and said that in this city the system of drainage

was very defective. Germs of disease, if not of death, are thus brought into our houses. He bore his testimony in favor of alcohol and milk punch administered during typhoid fever.

The Association then adjourned, to reassemble at nine A. M.

A CASE OF SPONTANEOUS HEMORRHAGE FROM THE GUMS.

By J. OTTLEY ATKINSON, L.D.S., R.C.S.

Cases more or less troublesome of hemorrhage from the alveolus, after tooth extraction, are occasionally met with by every one engaged in dental practice, and the treatment is so well understood that anything that could be said on this subject would be but a repetition of an oft-told tale ; suffice it to say that, in all ordinary cases, *pressure* must ever be regarded as *the* remedy. The writer, during thirty years' experience, has never yet met with a case where the hemorrhage could not be speedily arrested by a suitably-constructed lint plug properly applied, and the pressure persistently and intelligently kept up.

The following severe case of spontaneous hemorrhage from the gums (taken from the writer's note-book) differs from cases that are ordinarily met with by the dental practitioner, and on that account may be worth recording ; although a case greatly resembling it in many respects is described by Mr. Salter in his admirable work on "Dental Pathology and Surgery," *vide* page 182.

At ten o'clock on the morning of June 25, 1873, Mrs. M., a young married woman, aged 23, in humble circumstances, was brought by two female relatives to the writer's surgery, and gave the following history of her case :—At two o'clock in the morning she awoke in great alarm at finding herself almost smothered in blood, the bed-clothes being completely saturated and blood flowing profusely from her mouth, which she at first thought was coming from the throat, but on clearing the mouth found it proceeded from the upper gums on the right side.

With the assistance of her husband and mother everything that suggested itself to them was tried to arrest the hemorrhage, without any success.

This condition continued until seven o'clock, when she was taken to

a surgeon, who, with his assistant, tried various remedies for two hours and a half, without any better result. The patient, who was becoming exceedingly weak, was now sent to the writer, with the message that he was to extract one or more teeth in order to get at the bleeding vessels, and thus be enabled to stop the hemorrhage.

This advice greatly alarmed the patient and her friends, as they felt convinced she would soon bleed to death were any teeth removed.

The patient, who is tolerably healthy in appearance, has always enjoyed good health, and cannot account for this attack, as she has not previously experienced anything of the kind. She has not had a tooth extracted for the last six years, and on that occasion there was no bleeding worthy of notice. She suffers occasionally from toothache, arising from decayed teeth on the right side of upper maxilla. The patient states that she has been in the habit of pricking the gums for the purpose of making them bleed, and so obtain relief, but has no recollection of having done so lately. On proceeding to examine the mouth, after clearing away all the coagulated blood, etc., the blood was found to be welling up most profusely from between the right upper bicuspid, which were somewhat decayed. A suitable pad of lint was now saturated with perchloride of iron, and firmly applied with the finger and thumb to each side of the bicuspid—the object being to obliterate the bleeding vessels by firm and constant pressure. This almost immediately arrested the bleeding, and was kept up for twenty minutes, when, on removing the pad, the hemorrhage returned without any apparent abatement. Another pad was applied in the same manner and held firmly in the same position for nearly two hours, during which time there was no bleeding worth notice. At the end of this time, on the removal of the pressure, the pad was firmly adherent to the gums, in which state the patient and her friends were directed to allow it to remain. After resting half an hour on the sofa, with no appearance of further hemorrhage, the patient, who was exceedingly weak and unable to walk without assistance, was sent home and ordered to stay in bed. The two following days there was no return of the bleeding, the patient remaining in bed, and the pad still in position. She was now able to take fluids, a glass of wine, with egg beaten up, etc. On the third day the pad was removed and the patient permitted to leave her bed. From this time she gradually regained strength (although was never like herself again) up to July 19th, when she was prematurely delivered of a child (dead), and died a few hours after her accouchment. The writer could not obtain the particulars of her death, but

understands from her friends that she, as well as they, attributed it to the great loss of blood from the gums.

This case of severe hemorrhage is not easily accounted for ; the patient being advanced in pregnancy precludes a menstrual explanation and from the blood readily coagulating, with an absence of all symptoms usually seen in cases of purpura hemorrhagica, an explanation from this cause is also precluded. In the previous history of the patient there is also an entire absence of a hemorrhagic diathesis.

The treatment in this case shows what may be done by firm and well-directed pressure. Finger-and-thumb pressure is somewhat primitive practice ; but the case was urgent, and nothing better was convenient to hand. The writer had not then seen the simple but useful contrivance invented and described by Mr. Salter in his latest work.—*Monthly Review of Dental Surgery.*

FAINTING FROM CHLOROFORM—HOW RESTORED.

Mrs. S——, young, lymphatic temperament, rather frail constitution, and nursing an infant, came into my office accompanied by her husband a few days since to have a tooth extracted, which she stated had given her a great deal of pain, and she had had no rest from it for several days. She was somewhat excited and said I must give her *something*; I jokingly told her I would give her half a dollar if that would be any inducement; she said no, she must have some chloroform, stating that she was not afraid to inhale it, as she had done so before without harm. Whereupon I poured about a drachm on a couple of napkins which were just folded in my hand, in order that she might have plenty of air with it, and with my right fingers on the pulse proceeded, to administer it to her. She passed gradually and quietly under its influence to the extent that I thought I might proceed to operate without difficulty to myself or pain to her. The tooth, a wisdom in the left lower jaw, came away easily. She made a scream as if from pain, and then raised her head to the spittoon to spit out the blood; this she did, when I requested her to lie back in the chair for a time till she should pass fully from under the influence of the chloroform. On my attempting to lay her back in the chair she swooned and her head fell on the side next the spittoon, when seeing her in this alarming condition I took her in my arms from the chair, turned her head downward and

shook her violently, at the same time calling my friend, Dr. Morton, a medical gentleman who was in my office, to my assistance, who at once put his finger in her mouth and drew her tongue, which he found far back in the fauces, forward, when she gasped for breath, and was instantly restored, as it were, to life again, and another of those fatal accidents which we are called upon so often of late to chronicle averted "Death in a Dental Chair."

I would state for the benefit of your readers who use chloroform, that I lay much stress on the plan I adopted to restore my patient in this instance—turn the patient head down and heels up, not laid down, but in your arms, and shake well—at the same time have an assistant draw the tongue forward and dash some cold water in the face.

I have long been satisfied that it would be better for us, and our patients too, entirely to discard the use of anæsthetics in the extraction of teeth; but so long as there are teeth to extract, just so long will somebody be found to administer chloroform, and so long as chloroform is administered, just so long are these accidents liable to occur, and means of restoration be required; should the history of this case commend itself to your mind, you have my permission to lay it before your readers.

Yours truly,

Dallas, Texas.

JOHN C. STOREY, M.D., D.D.S.

MEETING OF THE DENTAL SOCIETY OF THE FIRST JUDICIAL DISTRICT OF THE STATE OF NEW YORK.

HELD AT THE RESIDENCE OF DR. W. H. ATKINSON, No. 41 E. NINTH
STREET, TUESDAY EVENING, APRIL 4, 1876.

Previous to the hour of meeting several of the members engaged in a discussion respecting methods of filling teeth.

Dr. Jarvis said he had removed some teeth from a gentleman who had had his teeth operated upon before in his native place. Some were filled with amalgam, which I found mostly, as far as the amalgam itself was concerned, in tolerable condition. The amalgam found in the central incisors seemingly never had hardened. The left lateral incisor was broken off by biting a stone, as he stated. The right lateral incisor was also broken off, it was understood by the same means. There had been no abscess. I found it had died long before

the tooth had completed its growth, so that, of course, it was all open at the extremity, and on the surface of the root it was open half way down to the margin of the gums. You will readily perceive that this was a very difficult case to treat. I inserted a filling—a gold filling—in the major surface, but how to treat the pulp chamber was a question which I was not able to decide, and have not decided yet, notwithstanding I did the best I could with it. It held easily, and I drew away some considerable blood from the pulp chamber. I then placed in the chamber oil of cloves containing a trace of creosote, and as much salycilic acid as the fluid would take up. I left that in the chamber for a number of days, then upon removing it the blood flowed very freely. I simply absorbed it until the blood was arrested, and again saturated that cavity with the same preparation. I then managed the best I could to get Hill's stopping in that chamber, to fill the cavity without a pressure upon the soft parts, which soft parts, of course, extended from the apex all over, down to the palatine surface of the root. I was governed in my manipulation by the patient's eye and my own digital sensibility. I succeeded in placing the gutta percha in so as to cover those two surfaces just spoken of and pack it down while it was warm. I then could feel that it was covered, so that the next application of the same material (warm gutta percha) would have definite limits, and, of course, that part of the operation was happily accomplished, by which means I closed the cavity. That operation was completed in that manner last Saturday. I have to-day found that everything is moving off charmingly. Now I ask for any suggestions as to any other method, or anything that could have been done better for that particular case.

Dr. E. G. Roy exhibited a specimen of cotton filling in a good state of preservation. A patient called upon me a week or so ago, and complained of a wisdom tooth giving her trouble, and I found that it lay horizontally upon the gum—the lower arch. I thought the crown of the tooth was the lowest, if anything. The posterior cusps were below the neck of the second molar. The pressure was already making the second molar sore a little, and had loosened it somewhat. She was also suffering from a cold, and, altogether, it took a great deal of trouble to get it out. After examining it I saw at once it could not be lifted without disturbing the second molar, and so I proposed to cut the crown. In a few minutes I cut off the end of the crown completely down through, and then lifted the tooth. I mention this, as an attempt was made to extract a tooth some two or three weeks ago, and

the tooth was crushed in the effort and broken, and it was not removed. The case was shown to me, and I said right away, if this operation had been done, cutting off the crown, it undoubtedly could have been removed without trouble. It was not necessary to cut deep enough to be but little sensitive.

Minutes of the last meeting were read by the Secretary and approved.

Dr. Atkinson reported that sixty-two visitors from different sections were present at the clinic.

The President announced, as the subject of the evening, "The treatment of proximal surfaces," and stated that, in accordance with a resolution adopted at the last meeting, questions would be asked by the members, to be answered by those to whom they were addressed.

Dr. Roy asked Dr. Francis, in reference to the treatment of proximal surfaces of sound teeth: Supposing you find quite a number of the proximal surfaces on the same tooth already decayed, will you let the sound teeth alone if the circumstances of decay are much the same, or will you anticipate them?

Dr. Francis: I should, of course, be governed by circumstances. If the teeth were very hard indeed I should leave all such teeth as were decayed. If the teeth were very crowded I should extract one or more on each side.

Dr. Roy: I would ask Dr. Allen how he treats simple decay on the proximal surfaces?

Dr. Allen: I cut it off close to the enamel. As a general practice, I should say, cut off the diseased part and polish the tooth.

Dr. Roy: Do you find in most cases that it arrests the decay?

Dr. Allen: I find that if I go to the bottom of the disease it does. I think we are all very much deceived. We think we go to the bottom when we don't. We leave, perhaps, something that we think won't decay—a little bit of irritation. But I think where it does not go through the enamel, the circumstances being favorable, it will not decay. In most cases, where there is slight decay, we might go through the enamel, if it is near the end of the teeth, and cut off that tooth so much as to make a cavity.

A paper was read by Dr. Jarvis on the treatment of proximate surfaces:

Mr. President and Gentlemen: In the first place, and having reference to both the deciduous and the permanent teeth, I would keep them clean from their first appearance through the gums, and they will need no further treatment. That is a *brief* but *possible* disposition of

the subject. It is not possible to conceive of a *clean* surface decaying. There may be seeming exceptions—instances which, for the want of a better term, may be called “spontaneous dissolution”—but they are not likely, for obvious reasons, to occur on the proximate surface, and are not known to occur there. The use of the brush, floss and pick, in connection with a dentifrice, and a sufficient or reasonable degree of exercise by way of mastication, will secure the desired condition of cleanliness. Practical should be combined with oral instruction.

The next stage is pathological. Dentists are not expected to call the righteous, but sinners, to repentance. Hence, when the case is presented to us, the proximate surface has lost its integrity. From this condition, represented by a slight discoloration and disintegration, to perhaps a depth of, say, one-sixth of the distance in the direction of the pulp chamber, and *not* extending in the direction of the crown so as to interfere with *its* integrity, I would perhaps, as a rule, extirpate, cut out, (referring to the diagram) cutting from side to side; that is, from the buccal and labial to the palatine and lingual, and leaving the surface slightly oval and highly polished. Various advantages are supposed to be gained by this treatment, not the least of which is the fact that the patient's attention is rather forcibly called to the danger and the location. The larger space will permit a lateral movement of food in the act of mastication, thus necessitating a healthy change; also, the space is more easily cleaned by the tooth-pick and suction with the tongue. This treatment is appropriate for *all* of the teeth unless situated so far back in the mouth as to be prevented by the lip.

Probably the best means to enlarge this space, especially with these square, crowded teeth, is to part them with the separator, then break off a hard wedge between the crowns at the point of contact, remove the separator and proceed to form the space with a suitable file, which has recently been made and somewhat resembles a penknife blade, presenting a plain, smooth surface to the gum.

We are ready now to advance to the next stage, which is when the decay has progressed so far that filling is a necessity. In all cases of proximate decay, where the biting surface of the crown maintains its integrity, I should consider it of the very first importance to leave it so, and really unnecessary to disturb it.

In case of bicuspid in the upper jaw, with narrow palatine cusps, and corresponding incisors, access may be obtained from the palatine surface without marring the crown. But, perhaps, in all cases in the lower jaw, and these square or flat and crowding bicuspids in the upper, and

these broad palatine faced incisors, I would get access from the buccal and the labial surfaces—which is very direct and far easier for both parties—making a surer operation, and not defacing the teeth in form at all after being replaced by the filling, and presenting a not particularly objectionable appearance. I have a lateral incisor, the least favorable of any of the teeth for this operation, cut away in this manner and filled about fifteen years since by Dr. Atkinson; and understanding the matter as I do now, I would not have the same cavity of decay reached from the palatine surface for any consideration.

It only remains to consider the last or extreme stage in the progress of proximate decay, and I will briefly say that when the crowns of the masticators and the palatine walls of the front teeth are broken away to any extent, or are ready to break away, I don't care *what* you do, you can't make matters any worse than they are. The best judgment must be exercised to determine what measures will most likely secure strength, cleanliness and comely appearance.

Dr. Francis: If a patient is brought to me, on the proximate surface of whose teeth I find simply a discoloration and stain, I should polish them off as soon as possible. I might do it with the chisel or might cut it with an instrument introduced by Dr. Lord, which, I will say, is one of the best in the world for cutting around the walls of the proximate cavities.

Dr. Littig: I very seldom cut bicuspid's away at all if I can possibly avoid it. In the central incisors, unless the walls of the cavity are remarkably thin I generally cut away. I have cut away bicuspid's, but I don't think I shall ever do it again. I try to cut through on the surface of the bicuspid's, then I separate with wedges and polish the surface the best I can. When I can cut through the grinding surface and cut through the fissure, I usually take that way.

Dr. C. E. Lattimer: I try to save the grinding surface and cut through the grinding surface cavity. I have sometimes, where vital surfaces have been decayed, gone through them and secured them so as to hold the two walls together. I build over with strips of gold without cutting through the enamel until I build them up. The gold will remain in contact with the enamel because gold is stronger, and makes the operation very successful. Where the teeth are long and well together, or the points are sensitive, then I make a very small groove at the lateral surface and separate them to get space. The strip of gold lies over and rests on the enamel.

Dr. Hoyt: I am very much in the habit of pressing the teeth apart,

even though they may not be decayed, when they are discolored, and then polish. If the decay is superficial and has not passed through the enamel, we certainly should not cut into the teeth, but I would clean them out and polish it the best that I could. If it went through the enamel at all, I should cut it, but I should not cut into them. I should press them apart far enough to cut in and form the cavity that I am filling. Neither should I cut down upon the surface if it was a possible thing to get in by any other means, but sometimes it is next to impossible to get in without cutting the surface. It is utterly impossible for the patient to keep them clean when cut away, but I believe it is possible to keep them clean after the teeth are pressed apart.

Dr. Roy: In most cases I should cut away. If the cavities are small I should cut away without disturbing the cavity.

Dr. Lord: It is a very beautiful theory, Mr. Chairman, that if the teeth are kept clean they won't decay, but, as has been remarked, we shall none of us ever see that day when the teeth will be kept clean enough so as not to decay. That it is possible, there is probably no question, but it is not probable, because people won't do it, except in a very few cases, so much so that the rule is they will not do it.

In regard to the treatment of the soft teeth, I have great confidence in anticipating trouble, and I think we can do it very often, that is, by cutting away a very slight portion of the proximate surface, cutting over the grinding surface, but leaving the surface free as much as we can. I would not cut from the lingual surface, but from the labial surface, because I would have to cut away more of the tooth, and I do not think the shape is so good to be kept clean. It cannot be kept clean so readily by means of a tooth-pick or floss silk. I would examine with a very thin instrument that can be passed between the teeth, except in very exceptional cases. By the use of such an instrument I would be able to detect the existence of decay, and would simply reduce that in soft teeth, and you will find that when you come to do it you will be surprised to see how little of the surface it will be necessary to remove if you remove from the grinding surface. I prefer to have the point of contact just as slight as possible. Perhaps we could illustrate it by putting two very thin edges together. Then persons will be more likely to keep the teeth clean, because they can do it so much more readily; and the rinsing of the mouth, to which I attach even more importance than the brushing of the teeth. It is necessary to teach persons to rinse the mouth, as there are very few persons who know how to do so. Some persons will take water in the mouth, and shake the

head to rinse the mouth. We have got to use the muscles of the face and tongue with great force, and in that way the water will be forced between the teeth to a greater or less extent, and that is the treatment I would give sound teeth in many cases. Here is a case where the teeth are all very hard. I examine the points of contact and I find that there is no breakage surface; there is no danger there. If the teeth are not so oval, but flat, and a great deal of surface in contact, I would rather relieve it a little in most cases, except in extraordinary density of the enamel. I think I can do more good by going over a set of teeth in that way, and I can clean it without pressing the teeth apart, with a suitable instrument that we can pass between the teeth, the same as we do floss silk. We can polish with an instrument also, with a little pumice stone.

If I find that decay has already commenced, but has not passed through the enamel, or just through it, I would cut it away and polish the surface. I have not great confidence in arresting decay after it has passed through the enamel. I think in very many instances the decay will extend. The same influences are at work. If the surface could be kept polished, then very likely you would escape further trouble, but in most cases they will not be kept sufficiently polished. I think, as a rule, that it is better to fill after decay has got through the enamel; that is my practice, but I do not break through the grinding surface if I can help it. We can only be governed by circumstances. Of course we want to leave sufficient tooth substance to insure, as far as we can, against any accident. If the decay is slight, I would cut away the teeth very little, and then wedge and fill. I would never fill, as a rule, and allow the fillings to come in contact again. I prefer a space, and at the same time I prefer to leave an oval surface, because I think an oval surface can be kept clean more readily than a flat surface; but I prefer never to fill, as many do, so that the fillings come in contact. I think it is safer in the future to leave it so that a space will be maintained. It may be a very thin space; of course we will prefer a thin space to a wider space, because it will be less likely to collect the food; but let us have a space, or leave the teeth in such a condition that the space will be maintained. Don't let us cut ourselves off from condensing and finishing. Success greatly depends upon the condensing and finishing accurately, and I would rather leave a space, under those circumstances, and not do anything that would prevent me from finishing up in that way. Where there is much decay, and the edges of the cavity thin from decay, it is necessary to reduce down until they are sufficiently thin. It was a new idea to me to put the two fillings to-

gether. I would not wish to lay a piece of gold over the plain enamel in that way, because there would be great danger of leakage there, and it makes a very unsightly appearance.

A case to-day—a young lady : I found her teeth all sound on the proximate surfaces, except in three cases, in which there was just a little disintegration of the enamel, that could very readily be taken out and polished. I examined each surface with this thin instrument. I found in some cases there was much more surface in contact than others, and there I reduced slightly, and when I came to the molar on the right side I proposed to reduce, but I found an immense cavity in the posterior of the proximate surface, and no appearance of it whatever. If I had just looked in the mouth casually I should have said those teeth are all sound, and I think we could not only prevent trouble and arrest it, but we would very often find decay on the proximate surfaces if we would examine that with reference to anticipating trouble; and in that way we would accomplish a great deal more for our patients. I always use a chisel; I never use a disk. I think I can drill as well with a chisel, and have chisels that will cut the teeth right down. The shape and temper is such that I have very little trouble in reducing the proximal surfaces. I had trouble for a long time in reducing the lower molars, but I have recently shaped my cutting instrument for that purpose, so that I cut away very quick. I think there is a great deal in putting through quickly as well as surely; and I think the quicker we get through our operations the better for our patients.

Dr. Allen : As a general rule, I should say that soft teeth should be cut more than hard ones. I do not fear that hard teeth will disintegrate and decay when they are close together, but I know that soft ones will. My experience has been very much as Dr. Lord relates his. The experience of the best dentists all over this country and all over the world has been just the same. When the teeth are left a little apart they are much less liable to decay. With regard to the temporary teeth in children's mouths, I have been in the habit of cutting away the temporary teeth. I have examined them much more closely than I did formerly, and almost always I have found there was a little decay. By cutting through the temporary teeth you can generally free the permanent teeth entirely from contact. In case of slight decay you can polish it, so that by the time the other permanent teeth come in there, the soft teeth will be harder. You will find in examining children's teeth more thoroughly, that in three-quarters of the cases where you think there is no decay, there will be. I think if every dentist practiced that for a

few days on young persons' teeth, they would find it a great advantage.

Dr. E. Parmelee : The decay of the teeth. I have found, to my surprise, more apparently perfect bicuspid teeth than any other teeth. I think I accounted for it on the theory that these bicuspid teeth were extracted from young patients. I split many of them apart, and not a single one was free from a dark stain inside. I do not believe you can produce one to-day that is perfectly developed.

In regard to cleaning the filling. People won't use floss silk. What can we do to prevent our children's teeth from decaying? Use medicated floss silk. Where can it be got? I take carbolic acid and saturate floss silk with it, and if that medicine don't do any good in polishing the proximate surface, it will disinfect the mouth.

Dr. Atkinson: I am impressed, from the remarks that I have heard, where the difficulty is, the point of contact being the point of decay. Now we all know that change takes place at the surface of fluids. In all chemical action it is always at the surface—the junction of the air and the water. Just so with regard to the teeth. If the teeth were kept constantly submerged they would probably remain constantly solid, but they are alternately wet and dry. Where is the point that they are kept in that state most? Just above the point of contact in the upper teeth, and just below in the lower.

The treatment of proximate cavities depends altogether on the relation of the teeth to each other, and it is too much of a subject to go into and say anything more than that you must approach your cavity in accordance with the particular case that is before you. The large columns of enamel that are on the proximal face of the upper incisors, if they cannot be preserved in enamel, then reproduce them in gold. Gold well packed is stronger than enamel. Enamel is not a protection to the teeth, only from the mechanical action in the line of the length of the arch, so that when you have a proximal cavity you will be very likely not to be able to fill in the gold from the side that shall support the lower part of the arch of enamel as well as the dentine did. Wherever you can make the gold stick to enamel as well as the dentine did, then I am not particular about that. But I do not think we have one bicuspid sufficiently well fused to enable us to have any confidence in the strength of the fusion. If you will bring me one of the teeth that you call so perfect I will put it under the microscope, and I will show you that there is not one-sixteenth of the fibre that is fused in the bicuspid teeth. When the teeth lap, it will be towards the cuspid, and it will always be directly above the point of contact,

and where the contact is will give you that fine polish that is so necessary to protect the ends of the enamel.

Drs. Miller, Northrop and Francis were appointed a committee to revise the By-Laws of the Association.

Next meeting at the residence of Dr. Jarvis, No. 19 West Thirteenth Street. Subject for discussion: "Treatment of pulpless teeth for the prevention of inflammation."

DOES COMPARATIVE PHYSIOLOGY TEACH US THAT THE TOOTH PULP PERFORMS NO FUNCTION TOWARDS THE VITAL PERMANENCE OF THE HUMAN TOOTH?

By F. H. BALKWILL.

At the February meeting of the Odontological Society, Mr. Charles Tomes is reported to have said that, "It was not known what the purpose of the pulp was in a finished tooth, nor why the tooth should not do just as well without it. As a matter of fact there were a good many teeth in other animals which did just as well without pulps, and which lasted sufficiently for the animal's requirements during its life-time. There were certain teeth in lizards in which there were no central living vascular pulps, yet they were not rejected as dead things to be thrown off. Until more was known as to the use of the pulp in a perfect tooth, it need not influence their practice."

This opinion calls in question all our preconceived orthodox notions, and, instead of appealing to the facts of human physiology alone, or the still narrower ground of our own experience, takes stand upon the wide field of comparative physiology. On this account it interests me, as I had already made a conjecture or two in the same field, which, as they led me to an opposite conclusion, I should like to record in contrast.

I quote from a paper in the *Zoologist* from July, 1873, p. 3,589: "The problem to be solved in the construction of teeth is rather different to that of bone. Here part of the organ has to resist more or less severe mechanical friction, has to be exposed, and at the same time maintain a strong connection with the living sensitive body. . . .

"Indeed, in fishes generally there seem to be few examples of teeth being implanted by fangs in sockets, and also there seems to be no

great permanency of connection between the teeth and their possessors.

“Amongst reptiles the same law of constant succession of teeth holds good, which looks as if there was the same *difficulty* of retaining the teeth permanently; but when we arrive at mammalia we find, at most, only one change of teeth, and this apparently in order to accommodate the adult animal with a larger set than would have been convenient for its young state. The peculiarities of structure which perform this apparently difficult feat are these.” Here follows a description of a mammalian tooth.

Owen, in his “Odontography,” p. 184, says of reptiles: “The completion of a tooth is soon followed by preparation for its removal and succession. The faculty of developing new tooth germs seems to be unlimited in the present class, and the phenomena of dental decadence and replacement are manifested at every period of life.” I do not know to what lizards Mr. Charles Tomes refers as having permanent teeth without pulp cavities, but as they seem to have been unknown to Professor Owen, the inference is that they form but a small exception to the general law he has laid down, too small in importance to give ground for the opinion that the pulp is of no value to the permanent life of a tooth. In the case of the lizards referred to, there may be peculiar circumstances in their food or habits which do not put their teeth to the average vital or physical strain. In fact, if we review the whole of the vertebrate animals, we find teeth on the plan of the human tooth, having a central vascular pulp, fangs covered by cementum and implanted in a socket, and a crown covered with enamel, are the only type fitted to endure much mechanical wear, and at the same time capable of maintaining a permanent vital connection with the body, and are mainly to be met with among mammalia; the exception being that referred to by Mr. Charles Tomes.

The only other teeth, I believe, capable of being classed as permanent teeth, are such as are continuously growing from a vascular pulp at the base, which fact suggests how their vitality is maintained.—*Monthly Review of Dental Surgery.*

“PERMANENT CLOSURE OF THE JAWS.”

The treatment of permanent closure of the jaws from contracted cicatrices, necrosis, ankylosis, and other causes, has not received very much attention from surgeons generally. As such cases are not of very

unfrequent occurrence, it will be interesting, no doubt, to some of our readers, if we refer briefly to the treatment of those who are the unfortunate victims of this pitiable condition.

There have been two operations proposed and practiced. Professor Rizzoli, of Bologna, conceived the idea of simply dividing the jaw; he made no external incision whatever, but completed the section of the bone from the mouth by means of powerful forceps. In this way he operated upon four patients; and at a later date M. Verneuil reported other cases which had also been operated upon in the manner suggested by Rizzoli.

Professor Esmarch's operation consisted in removing a piece of bone from in front of the contracted cicatrix, so as to establish a false joint anterior to the cause of occlusion. It necessitates an external incision, which, however, is a matter of no real importance, whilst it permits the use of the saw instead of the forceps for the purpose of dividing the bone, and thus does away with the risk of splintering. Dieffenbach had previously recommended nearly the same operation, and had tried it, but without any good result, as he endeavored to make the false joint behind the contraction instead of in front of it. There is a third procedure, which has been adopted by Mr. Barnard Holt and Mr. Heath, in cases where cicatrices have existed on each side of the mouth. It consists in the division of the cicatrices from within the mouth, and then keeping the surfaces apart by means of shields properly adjusted to the teeth. These shields require to be constantly modified. The treatment is prolonged and tedious, whilst the operation is difficult and bloody; and the patient ought to be of an age at which he can give assistance to the surgeon and dentist. Although in both Mr. Holt's and Mr. Heath's cases what were considered satisfactory results were obtained, this treatment is not one which is likely to be often followed, owing to the trouble it entails both upon the patient and the surgeon.

The operation which, on the whole, has proved most successful, and which is most frequently resorted to, is Esmarch's. It was first performed in this country by Mr. Mitchell Henry, M. P., when that gentleman was a member of the surgical staff of the Middlesex Hospital; subsequently Mr. Christopher Heath operated upon two cases with success.

We have now an opportunity of publishing the notes of four recent cases, three of which have occurred in London hospitals, and one at the Hotel-Dieu, Paris. For the particulars of the last named case we are indebted to Dr. Charnley, late Clinical Assistant of the Middlesex Hospital.

The London cases were of similar origin; two had followed on scarlatina, and one after measles. The Paris case comes under another category altogether; its exciting cause was a decayed tooth. Mr. Mac Cormac's and Mr. Lawson's patients had each suffered from necrosis of the jaw as well as sloughing of the cheek; in the former there was a bony lamella between the upper and lower jaws. Mr. Lawson had tried a milder treatment on his patient eighteen months before she was submitted to Esmarch's operation. It will be noticed that in his case eleven months have elapsed since the operation, and that, though for some length of time afterwards the result was perfectly satisfactory, quite recent reports prove that no great permanent good has been effected. In Mr. Mason's case—and, it is to be inferred, in M. Richet's also—there was firm ankylosis of the joint on one side, but there had been no sloughing of the cheek, and no adhesion between the cheek and gums. The permanent result in their cases may possibly, therefore, prove more favorable. The three English surgeons removed a wedge of bone from the lower jaw. M. Richet seems simply to have divided the bone. The only course which seems likely to be followed by lasting success in cases of necrosis and sloughing is to remove a considerable piece, and better still, perhaps, the whole side of the lower jaw from the joint to just in front of the cicatrices.—*Monthly Review of Dental Surgery.*

DEATH FROM CHLOROFORM.

We regret to have to record a death from chloroform, which occurred at St. Mary's Hospital on July 5th. It illustrates several special points; and, by the courtesy of Mr. Norton, the surgeon in charge of the patient, and of Mr. Juler, the resident chloroformist of the hospital, we are enabled to furnish the following details.

A robust laboring man, aged about 45, was admitted with a fibrous tumor, involving both hard and soft palate; it had been growing for about three months, and was then as large as a walnut, so that Mr. Norton decided to remove it. He advised the man not to have an anæsthetic, but to no purpose; the nature of the operation, and the presence of Wood's gag in the mouth made *ether* inadmissible, and prevented also the use of the mouth-piece attached to Clover's apparatus, the usual mode of giving chloroform at St. Mary's. The patient, having had breakfast at 8 A.M., and having had one ounce of (diluted)

brandy about half an hour before the operation at 2 P.M., and being dressed in an ordinary loose jacket, was placed sitting, though not exactly upright, in an arm-chair, and Mr. Juler commenced to give chloroform on a napkin folded conewise. The day was very hot, and the quantity first poured out was about a drachm. Very soon the patient began to struggle violently, and more chloroform was poured out, the whole quantity calculated at three drachms, and being certainly less than four. Within two or three minutes, the patient, struggling violently, had risen to his feet, and pulled the gag from his mouth. Mr. Juler, *before recommencing the chloroform*, had the patient laid flat on the operating-table, and then he turned to take up a cone of flannel with which to continue the administration. The patient was then quieter, and breathing rather heavily; Mr. Norton had a finger on the radial pulse, which was beating normally, when suddenly the sound of breathing ceased, and the face turned rather dusky. Whether the pulse continued afterwards or not could not be positively stated, but Mr. Norton felt convinced that the respiration stopped first; at the same moment he saw the tongue protrude between the teeth. The tongue was immediately pulled forward, the head and shoulders drawn downwards below the level of the table, the body being turned somewhat to the left, and Sylvester's method of artificial respiration was commenced and continued for half an hour. A few gasps occurred, and air freely entered the lung, but no sign of life was observed. Meanwhile the face and chest were slapped with wet towels, and the phrenic nerve faradized, *i. e.*, one pole of Stöhrer's battery was placed on the nape, and the other at the epigastrium. At the *post mortem* examination, no tangible explanation of the death was afforded; the heart was rather flabby and light-colored in parts; the lungs and also the brain moderately congested. At the inquest, it being ascertained that the administrator was competent and experienced (having been chloroformist for nearly two years, and having had nine hundred cases and no death), a verdict of "Death from Chloroform" was returned.—*British Medical Journal*.

THE MAGNETO-INDUCTION MACHINE.

By DR. EDUARD ZETZSCHE.

The principle of these machines (Von Hefner-Alteneck's system) is founded on the fact that a current is induced in a closed circuit when a portion of such circuit is introduced between a magnet whose opposite poles face each other. The direction of the induced current de-

depends on the position of the poles with relation to the direction of the motion. The poles of a permanent steel magnet or of an electro-magnet can be employed; in the latter case, the electro-dynamic principle—discovered independently by Dr. Werner Siemens and Professor Wheatstone—comes into play. By this principle the current of the machine is itself instrumental in exciting the electro-magnetism, by adding strength to the remanent magnetism originally present in the cores of the electro-magnet. The conductor in Hefner's machine is a covered copper wire, which, for an electric light apparatus, is wound in eight separate parts upon a German-silver cylinder, and parallel to the axis of the cylinder. The coils entirely surround the cylinder.

The exterior of the wire cylinder is partially surrounded at opposite sides, above and below, by bent iron bars, these bars inclosing about a third of the circumference of the cylinder, and being at right angles to its axis. There are as many of these bars as the length of the cylinder will admit of, and they form the cores of the electro-magnets. The bars are nowhere at a greater distance from the wire cylinder than is necessary for the latter to revolve. The two sets of bars or poles form magnetic fields of high intensity, through which the wires of the bobbin move. To combine the opposite currents induced in the separate coils into a current of common direction, the circumference of the cylinder is divided into eight equal parts, covered with two wires of equal length, coiled one over the other. These wires have sixteen ends, which are led through hollow pivots on the cylinder to a commutator plate that revolves with the wire cylinder. This commutator comprises eight metal sectors arranged on a plate, but separated from each other by narrow radial spaces.

At two places, diametrically opposite, a metal wheel is pressed against the commutator plate by means of a strong spring. These two metal wheels form the electrical poles of the machine, and are connected to suitable terminal screws. Between these electrical poles, and joined to them by leading wires, is placed the lamp with its carbon points. From the poles flows on the one side a negative, and on the other side a positive current, always in one direction. As long as this external circuit remains open the machine requires an impelling force scarcely exceeding that necessary to overcome friction. With a closed circuit the quantity of electricity generated by the machine, and at the same time the work consumed by it, increase rapidly; and a small increase in the speed of revolution of the bobbins gives considerable augmentation to the current. The intensity of the magnetic field is increased

—and consequently the current-intensity—by a fixed iron core placed inside the hollow wire cylinder. As this fixed position prevents the occurrence of Foucault's currents in the iron core, the machine gains, inasmuch as these currents involve unnecessary consumption of work, and give rise to heating.

In smaller machines, however, in which saving of force is not so important, the advantages derived from fixing the iron core will not always outweigh the benefits of simple construction, and in such instances it is better to let the iron core revolve with the wire coils. At the same time, to reduce these Foucault currents to a minimum as far as practicable, the core should not be made of massive iron, but of coils of iron wire wound on a wooden cylinder. There is described, besides the electric-light machine (which at 450 revolutions per minute gives a light equal to that of 14,000 normal candles), a small machine suited for physical laboratories, which, with an internal resistance of half a Siemens unit, and at two revolutions per second, gives a current equal to that from 10 Bunsen elements joined in series.—*Dingler's Polytechnisches Journal*.

SOLILOQUY UPON A TOOTH.

By WILLIAM MANNING.

To ache, or not to ache, that is the question—
 Whether 'tis nobler in the jaw to suffer
 The pangs and anguish of outrageous toothache,
 Or to take forceps 'gainst a mouth of troubles,
 And by extracting end them? To lie (but sleep
 No more), or, by a wrench, to say we end
 The toothache, and the thousand natural shocks
 That teeth are heirs to—'tis dental surgery
 Devoutly to be wish'd. To cry—to weep;
 To weep! perchance to scream; aye, there's the rub,
 For in that throbbing pain what pangs may come
 (When we have shuffled off the hot salt bag),
 Must give us pause: there's the respect
 That makes calamity of many teeth!

* * * * *

How hard to lose so true and stanch a friend !
How sad to part with such an honest slave !
A slave indeed from infancy : for when
Those sucking teeth are gone, those playthings which
In their generation served to nibble
Gingerbread and sugar, oh ! then there rose
Those steadfast ivories, those firm, fast friends,
To do my bidding and to crush my crust.
What was my palate's will was their delight ;
And pitiful it is, to think that now
Their once most solid and united ranks
Have had to mourn a grinder true and firm !
A dismal gap, inelegant and graceless,
Is all to tell that but an hour ago
One of their comrades fell, of glittering steel
THE VICTIM !

SCIENCE IN AMERICA.

The following passage taken from the opening address of Professor Sir William Thomson, on assuming the chair of the section of physical science at the Glasgow meeting of the British Association, will be read with interest as showing the impression made upon an English student of Science by our progress in discovery and practical science:

“Six weeks ago, when I landed in England after a most interesting trip to America and back, and I became painfully conscious that I must have the honor to address you here to-day, I wished to write an address, of which Science in America should be the subject. I came home, indeed vividly impressed with much that I had seen, both in the great Exhibition at Philadelphia and out of it, showing the truest scientific spirit and devotion and originality, the inventiveness, the patient, persevering thoughtfulness of work, the appreciativeness, and the generous open-mindedness and sympathy from which the great things of science come.

“I wish I could speak to you of the veteran Henry, generous rival of Faraday in electro-magnetic discovery; of Peirce, the founder of high mathematics in America; of Bach, and of the splendid heritage he has left to America and to the world, in the United States coast survey; of the great school of astronomers which followed—Newton, Newcomb, Watson, Young, Alvan Clarke, Rutherford, Draper, father and son; of

Commander Belknap, and his great exploration of the Pacific depths by piano-forte wire, with imperfect apparatus supplied from Glasgow, out of which he forced a success in his own way, and of Captain Sigbee, who followed with the like fervor and resolution, and made further improvements in the apparatus, by which he has done marvels of easy, quick and sure deep sea soundings in his little surveying ship Blake, and of the admirable official spirit which makes such men and such doings possible in the United States naval service.

“I would like to tell you, too, of my reasons for confidently expecting that American hydrography will soon supply the data from tidal observations, long ago asked of our government in vain by a committee of the British Association, by which the amount of the earth’s elastic yielding to the distorting influence of sun and moon will be measured; and of my strong hope that the compass department of the American navy will repay the debt to France, England and Germany, so appreciatively acknowledged in their reprint of the works of Poisson, Airy, Archibald Smith, Evans, and the Liverpool compass committee, by giving in return a fresh marine survey of terrestrial magnetism to supply the navigator with data for correcting his compass without sight of sun or stars. I should also tell you of ‘Old Prob.’s’ weather warnings, which cost the nation \$250,000 a year, money well spent, say the western farmers, and not they alone; in this the whole people of the United States are agreed, and though Democrats or Republicans playing the “economical ticket” may, for half a session, stop the appropriations for even the United States coast survey, no one would for a moment think of starving ‘Old Prob.’; and now that 80 per cent. of his probabilities have proved true, and General Meyer has, for a month back, ceased to call his daily forecasts probabilities, and has begun to call them indications, what will the western farmers call him this time next year? The United States naval observatory is full of the very highest Science, under the command of Admiral Davis.

“If, to get on to precession and nutation, I had resolved to omit telling you that I had there, in an instrument for measuring photographs of the transit of Venus shown me by Professor Harkness (a young Scotchman attracted into the United States naval service), seen, for the first time in an astronomical instrument, a geometrical slide, the verdict on the disaster on board the Thunderer, published while I am writing this address, forbids me to keep any such resolution, and compels me to put the question: Is there in the British navy, or in a British steamer, or in a British land boiler, another safety valve so con-

structed that, by any possibility, at any temperature, or under any stress, it can jam? and to say that if there is, it must be instantly corrected or removed. Can I go on to precession and nutation without a word of what I saw in the great Exhibition at Philadelphia? In the United States government part of it, Professor Hilgard showed me the measuring rods of the United States coast survey, with their beautiful mechanical appliances for end measurement, by which the three great base lines of Maine, Long Island and Georgia were measured with about the same accuracy as the most accurate scientific measures, whether of Europe or America, have attained in comparing two meter or yard measures. In the United States telegraphic department I saw and heard Elisha Gray's splendidly worked-out electric telephone, actually sounding four messages simultaneously on the Morse code, and clearly capable of doing yet four times as many with very moderate improvements of detail; and I saw Edison's automatic telegraph delivering 1,015 words in 57 seconds—this done by the long-neglected electro-chemical method of Bain, long ago condemned in England to the helot work of recording from a relay, and then turned adrift as needlessly delicate for that.

“In the Canadian department I heard ‘To be or not to be’—‘there’s the rub,’ through an electric telegraph wire; but, scorning monosyllables, the electric articulation rose to higher flights, and gave me passages taken at random from the New York newspapers: ‘S. S. Cox has arrived’ (I failed to make out the S. S. Cox), ‘The city of New York,’ ‘Senator Morton,’ ‘The Senate has resolved to print a thousand extra copies,’ ‘The Americans in London have resolved to celebrate the coming Fourth of July.’ All this my own ears heard spoken to me with unmistakable distinctness by the thin, circular disk armature of just such another little electro-magnet as this which I hold in my hand. The words were shouted with a clear and loud voice by my colleague judge, Professor Watson, at the far end of the line, holding his mouth close to a stretched membrane, such as you see before you here, carrying a little piece of soft iron, which was thus made to perform in the neighborhood of an electro-magnet in circuit with the line motions proportional to the sonoric motions of the air. This, the greatest by far of all the marvels of the electric telegraph, is due to a young countryman of our own, Mr. Graham Bell, of Edinburgh and Montreal and Boston, now becoming a naturalized citizen of the United States. Who can but admire the hardihood of invention which devised such very slight means to realize the mathematical conception that, if electricity is to convey all the delicacies of quality which distinguish articulate speech, the strength of its current must vary continuously, and, as nearly

as may be, in simple proportion to the velocity of a particle of air engaged in constituting the sound?

“The Patent Museum of Washington, an institution of which the nation is justly proud, and the beneficent working of the United States patent laws, deserve notice in the section of the British Association concerned with branches of Science to which nine-tenths of all the useful patents of the world owe their foundations. I was much struck with the prevalence of patented inventions in the Exhibition; it seemed to me that every good thing deserving a patent was patented. I asked one inventor of a very good invention, ‘Why don’t you patent it in England?’ He answered, ‘The conditions of England are too onerous.’ We certainly are far behind America’s wisdom in this respect. If Europe does not amend its laws (England in the opposite direction to that proposed in the bills before the last two sessions of Parliament), America will speedily become the nursery of useful inventions for the world. I ought to speak to you, too, of the already venerable Harvard University, and of the Technological Institute of Boston, created by William Rogers, brother of my Glasgow University colleague, Henry Rogers, the Cambridge of America, and of the Johns Hopkins University of Baltimore, which, with its youthful vigor, has torn Sylvester from us, has utilized the genius and working power of Roland for experimental research, and three days after my arrival in America sent for the young Porter Poinier to make him a Fellow. But he was on his death-bed in New York, ‘begging his physicians to keep him alive just long enough to finish his book, and then he would be willing to go.’ Of his book, ‘Thermodynamics,’ we may hope to see at least a part, as much of the manuscript, and kind and able friends to edit it, are left; but the appointment of a fellowship in the Johns Hopkins University came a day too late to gratify his noble ambition. But the stimulus of intercourse with American scientific men left no place in my mind for framing, or attempting to frame, a report on American Science.”

[*Scientific American.*

CAN WE CHECK THE SPREAD OF DENTAL EMPIRICISM?

To the Editor of the British Journal of Dental Science.

SIR: Several letters have been published in late numbers of your Journal, expatiating upon the practices of that class I would call by their generic name, “Gutter Dentists.” Not only do they infest every part of the provinces, but they also abound in this great metropolis, and a

feeling appears somewhat to have sprung up that the "London men cannot feel the same interests in stamping out quackery" as those in the country do. I am convinced that the gentlemen with whom I am permitted to associate feel the deepest interest and evince the heartiest desire to expose and put down empiricism in every form. The only question upon which we differ is, *How best to do it?*

The letters signed "Pro bono publico," "Senex," and "Urtica," expose a state of things that cannot calmly be submitted to, and if in any other class of manufacture similar frauds were committed as those mentioned by your correspondents—the substitution of brass for gold—the public would be up in arms to denounce the imposition. But it appears that any description of swindle can be safely carried on in dental matters without protest or hindrance. Have we any remedy for this crying evil? I think that we certainly have, and I can only repeat what I have so often said before. Educate the public to understand what is meant by the words "disreputable quack," and do not allow the "whole profession to rest under a stigma from the faults of the few."

Every one must be aware that the writing of any number of letters or leading articles in the dental or the medical journals can do but little good, as they are principally read by members of the dental or the medical profession, well acquainted with the present state of things. It is to the public, and to the public alone, we must appeal, and the only question we have now to ask is, *How successfully to do so?*

"Urtica" pleads for legislation, and his letter is well worth careful perusal. "Senex" advocates the formation of a society "which shall take cognizance of the doings of such rascals," and all acknowledge that if the profession were better understood the "Gutter Dentist" would be held in fear and avoided as a pestilence.

Perhaps I have had as good an opportunity of considering this question in all its bearings as any members of the profession, and I am not ashamed to say I take a great interest in it; and as my experience may be of some use to those who are trying to check the spread of empiricism, I take the liberty of calling your attention to the history of my book published a year ago, entitled "Vernon Galbray." Its aim, as you know, was "to expose the disgraceful frauds practiced upon the public by the horde of charlatans who call themselves dentists." Prior to the publication of this little volume I addressed a letter to the profession anonymously, stating that it was issued for the purpose of "eliciting the feeling of the profession on this important subject." I explained that I intended to bring out a further issue with additional

matter, and that the profits were to be expended in advertising the book, not in London only, but also in the country. To this letter I received through my publisher 107 replies. All my correspondents applauded the object I had in view, but doubted my power to carry it out. Many suggested that the profession should take a certain number of copies for free distribution, but the book being published at a price that left no margin of profit, the greater the circulation—if properly advertised—the greater the personal loss to the author; but this I was willing to meet. The book being published anonymously, I had no expectation of gaining fame—even if it merited praise—by its publication. There is no doubt if I had shown a little less delicacy, and if I had affixed my name to the volume, and published it at a price that would pay for advertising, both the public and the author would have been better served. The dental profession looked upon the volume with suspicion, and the general reviewer could hardly receive with favor a work that criticised the proceedings of his own class so severely, quite forgetting that it was only a certain section of itinerate penny-a-liners I attempted to censure. The newspaper proprietor saw that the volume tried to deprive him of a portion of his income—the advertisements—unmindful that the author's only complaint was the introduction of leading articles praising certain charlatans, and trying to make it appear that these articles emanated from the editorial staff of the paper. Still, standing as I did on dangerous ground—an anonymous author—its reception was most favorable. I was told that the book “would be read with great satisfaction,” “that the striking statements made were scarcely in excess of the truth,” “that it would secure and interest a large number of readers,” “that the author's object was a laudable one, and that it rested with the public to complete the work of eradication.”

At this period the book got over to America and was reviewed there, and an attempt was made to saddle its authorship upon a perfectly irresponsible individual. What could I do? I was forced to acknowledge myself the author, and to risk the danger of being charged with having ulterior views. I had succeeded in obtaining proofs, and very powerful proofs, that this book is barbed with a sting the empiric cannot resist. I have been threatened, I have been personally insulted, and every means has been taken to try and interfere with the sale of the book. I can, without egotism, declare that the class it aims at exposing smart under its censure. The appendix alone, and it is my intention to greatly extend it, if properly circulated must disarm the advertiser; for would any man be such a fool as to consult these “disreputable snobs” after reading the well-authenticated records of their proceedings?

“Empiricism such as he describes,” says the *Lancet*, in reviewing the book, “is still too prevalent ; but its day is passing. It rests with the public itself to complete the work of eradication.”

If “Vernon Galbray” is not sufficient for this purpose let another and a more powerful hand take up his pen, and I for one will welcome the attempt, and place my ten guineas towards the object we have all at heart. In the meantime I am prepared to embody any well-authenticated records of the charlatan’s proceedings in the appendix, and should be pleased to receive any suggestions calculated to aid in advancing the circulation of the book.

I am, &c., FELIX WEISS.

OBITUARY—DR. L. E. BROCKWAY.

Suddenly, of typhoid fever, at Syracuse, N. Y., September 7th, 1876, Dr. L. E. Brockway, of Brooklyn, N. Y., in the 45th year of his age.

At a regular meeting of the Brooklyn Dental Society, held Monday evening, September 11th, 1876, the following preamble and resolutions were unanimously adopted.

Whereas, Dr. L. E. Brockway has been removed from us by death, we, his associates and fellow-members of the Brooklyn Dental Society, at this our first meeting since his decease, cordially unite in the following resolutions:

Resolved, That we are deeply grieved at the death of our brother, and in recognition of his character and services to this Society and our profession, we desire to place on record our sincere sorrow.

Profoundly lamenting his untimely decease, we rejoice in the memory of his many excellent qualities of head and heart.

Owing to his modest and retiring disposition, only those who knew him long and intimately could thoroughly appreciate him.

Earnest and thorough in the duties of his profession, true to the best interests of our Society, amiable and considerate as a companion, warm-hearted as a friend, we feel that in his death this Society and the community have lost a reliable, competent and conscientious practitioner and most worthy citizen.

Resolved, That the Secretary of this Society be directed to send a copy of these resolutions to the family of the deceased, with assurances of our sincere sympathy in their bereavement, and that these resolutions be published in the Brooklyn and Syracuse daily papers and in the dental journals.

DR. W. H. ATKINSON, Pres’t.

C. P. CRANDELL, Rec. Sec’y.

NOTES.

Editorial Responsibility.

The "Note" to which the reader of the article on "Amalgam Mercury—Its Use and Abuse," page 321, in our last issue, was directed, and which was inadvertently omitted from that number, would have read as follows: The Editor of the MISCELLANY, while happy to receive and give space to articles of general interest to the dental profession, even though somewhat controversial, if they are gentlemanly in their tone, does not hold himself, by so accepting essays, in any way responsible for the opinions expressed by the writers.

Brooklyn Dental Society.

This Society held its annual meeting Monday evening, Oct. 9th, 1876. The officers elected for the ensuing year are as follows: President, H. G. Mirick; Vice-President, W. W. Starr; Recording Secretary, C. P. Crandell; Corresponding Secretary, Wm. Fishbough; Treasurer, F. W. Dolbeare; Librarian, C. E. Mensch.

C. P. CRANDELL, *Rec. Secretary.*

We are glad to announce the proposed re-appearance of the *Canadian Journal of Dental Science*, on January 1st, 1877—its fourth volume. Its life and vigor are, as before, due to our energetic, enthusiastic and ready friend, Dr. W. George Beers, of Montreal, Canada.—ED.

New Artesian Well, Charleston, S. C.

A new artesian well is in progress and has now reached a depth of nearly three hundred feet. The drills are still digging their way through the eocene marl of the Ashley River beds, and at a depth of two hundred and sixty feet a stratum of silicious rock, about three feet in thickness, was struck and passed through without much

difficulty. In this stratum are found millions of little microscopic shells, which are almost invisible to the naked eye, but upon being viewed through a magnifying glass are clearly seen as beautiful nautilus-shaped shells, perfect in formation and color. The work is creating much interest, and numbers of scientific gentlemen visit the well every day for the purpose of inspecting the fossils.

Cleaning and Reducing Gold Filings.

It would appear that the usual process for the recovery of dirty filings is unnecessarily tedious. Taking 2½ oz. of very dirty filings from a tray not in regular use, I added 3 oz. of strong nitric acid, and boiled the mixture in an enameled iron cup until nearly dry, stirring occasionally with a glass rod so as to expose the whole surface of the filings to the proper action of the acid. I then washed the residue repeatedly with water, pouring off the washings into a bowl to settle.

The filings did not look by any means clean, as they contained a large amount of insoluble foreign matter, but I melted them up with the blowpipe and ingot mould arrangement. The result was a smooth ingot, hard and elastic when rolled, but perfectly sound and tough. It would appear from this that the recovery of the dirtiest filings is really little more trouble than the production of plate from scrap, and from its hardness and elasticity the gold obtained is particularly valuable for bands, etc. The quality was as near as possible the same as the plate from which the filings were obtained; the platinum always present in filings will fully account for the special hardness.—THOS. FLETCHER, in *British Journal of Dental Science*.

JOHNSTON ADJUSTABLE FOUNTAIN SPITTOON.



The defects of the Fountain Spittoons hitherto made are, that it is almost impossible to keep them from leaking, and that they occupy a rigid position close to the left of the chair, and hence prevent the operator from working on that side.

These defects will not be found in this spittoon, which is commended to the favor of Dentists by the following points of merit:

1st. It is readily adjustable to the position of the chair; that is, it can by an easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches to the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient, the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way.

3d. Instead of a wooden case, twelve inches square, is an ornamented metal tube one and a half inches in diameter, which will not warp, occupies very little room.

4th. Movable joints are so arranged that any leakage is impossible, since the waste from the bowl never comes to the joint itself, but is discharged below, in the bottom of the lower half of the socket of the globe, and conveyed into the waste pipes.

5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

6th. All its bright parts are of gun metal, and its tubing silk covered.

The water jet used is the device of Dr. Redman, of Louisville, Ky.

Price.....\$60.00

Boxing.....2.00

JOHNSTON BROTHERS, 812 Broadway, N. Y.

The Morrison Dental Chair.



Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure for those who may so desire *the rotary movement*, some of these chairs have legs, into which castors are cast. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and as pictured on the chair has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of \$8.00.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

PRICES.

In fine green or garnet plush—with Morrison Head-rest.....\$ 150.00

Boxing..... 5.00

To which price add, if ordered :

With Castors.....10.00

With Johnston Head-rest, instead of Morrison..... 8.00

With extra back-pad..... 4.50

With spittoon attachment and porcelain cuspador..... 8.00

With nickled metallic cuspador and gold trap.....10.00

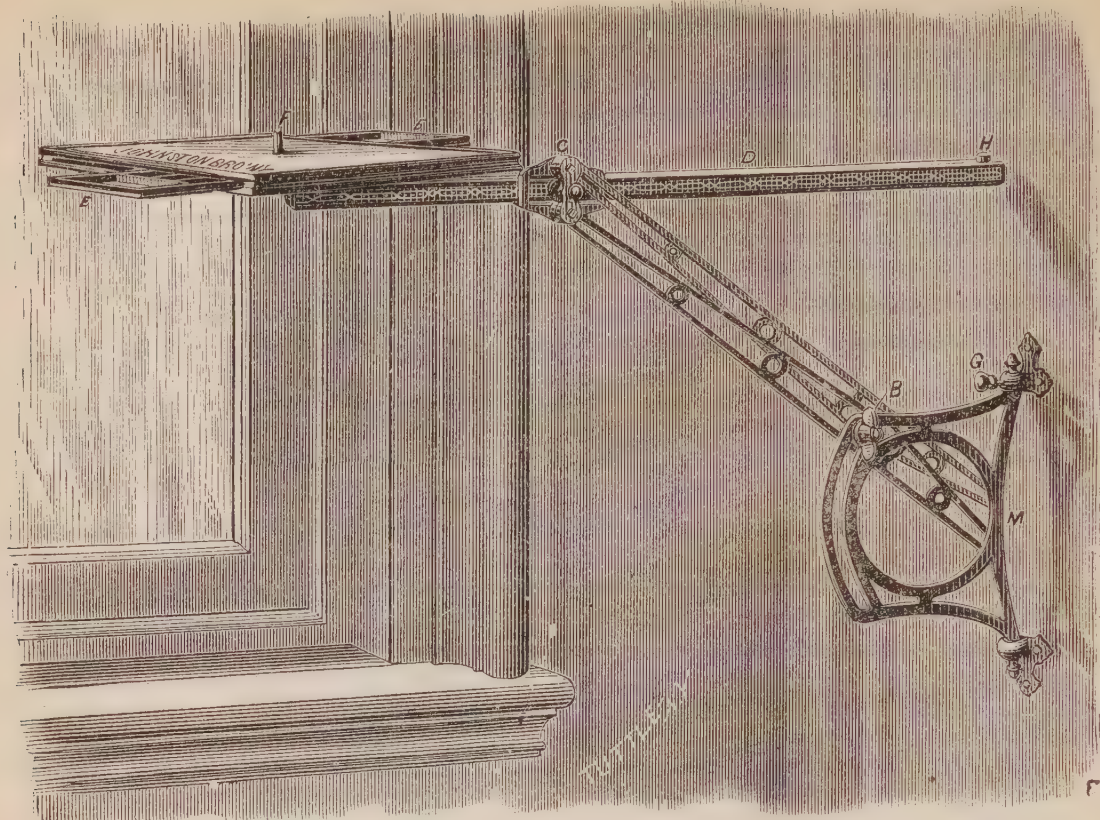
With Turkish upholstery.....15.00

Real morocco embossed.....10.00

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

MORRISON DENTAL BRACKET



PRICES.

With Black Walnut Table, 12 inches square.....	\$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather.....	40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket.....	17.00.
Boxing.....	\$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these :

- 1st. It combines a greater variety of range and movement than any other.
- 2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
- 3d. It provides a clean receptacle for foil and instruments.
- 4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
- 5th. Its drawers extend through the table and can be opened from either side.
- 6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

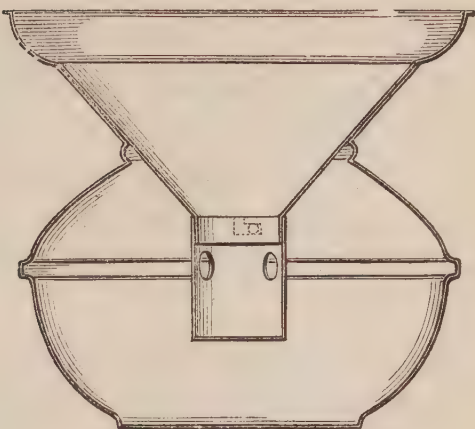
JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

NICKEL PLATED CUSPADOR WITH GOLD-TRAP.



CUSPADOR.



Section of the cuspador, showing the Funnel with gold-trap attached.

The cuts represent a metallic cuspador, handsomely nickel plated throughout, designed to fit the spittoon attachment of the Morrison Chair. As the funnel can be removed by simply lifting it from the Cuspador, all parts are as readily cleaned as is the porcelain Cuspador now in use. The gold-trap—which is an attachment of the funnel—will, in a short time, effect a saving sufficient to pay for the Cuspador.

PRICES.

Spittoon Bracket, plain.....	not pictured.....	6 00
“ “	Nickel Plated— “ “	8 00
Nickel plated Cuspador and Funnel with Gold-Trap..		\$10 00
Funnel and Gold-Trap.....		3 50

JOHNSTON BROS.,
812 Broadway, N. Y.

TOOTH BRUSHES.

A first-rate article.

4 Row Brushes, per dozen.....	\$3 00
5 “ “ “ “	3 80
Children's Brushes “	2 30

JOHNSTON RBOS.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or “chattering” which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

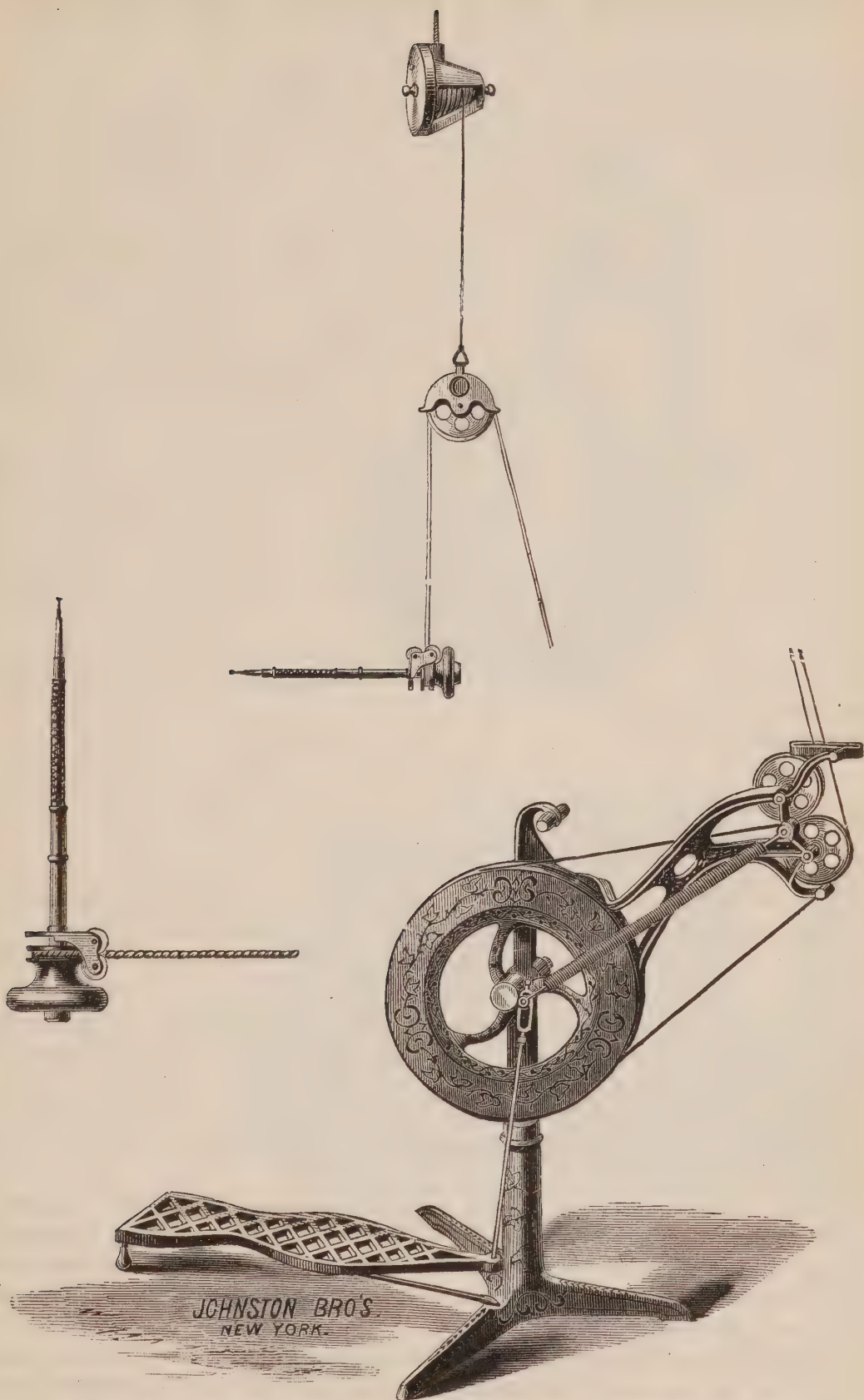
4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a “*light running*” Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROTHERS, 812 Broadway, N. Y.



SUSPENSION DENTAL ENGINE.

(DR. ELLIOTT'S INVENTION.)

Price, \$50.00. Right Angle Attachment, \$5.00. Boxing, \$1.00.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($\text{NO}^2 + 2\text{O} = \text{NO}^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid Nitrous Oxide*, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether.....	I	death to 23,204 administrations.	
Chloroform.....	I	" 2,723	"
Mixed Chloroform and Ether....	I	" 5,588	"
Bi-chloride of Methylene.....	I	" 7,000	"
NITROUS OXIDE.....		no Deaths in 75,000	"

Edward R. Squibb, M.D., than whom our country has no more able pharmacist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

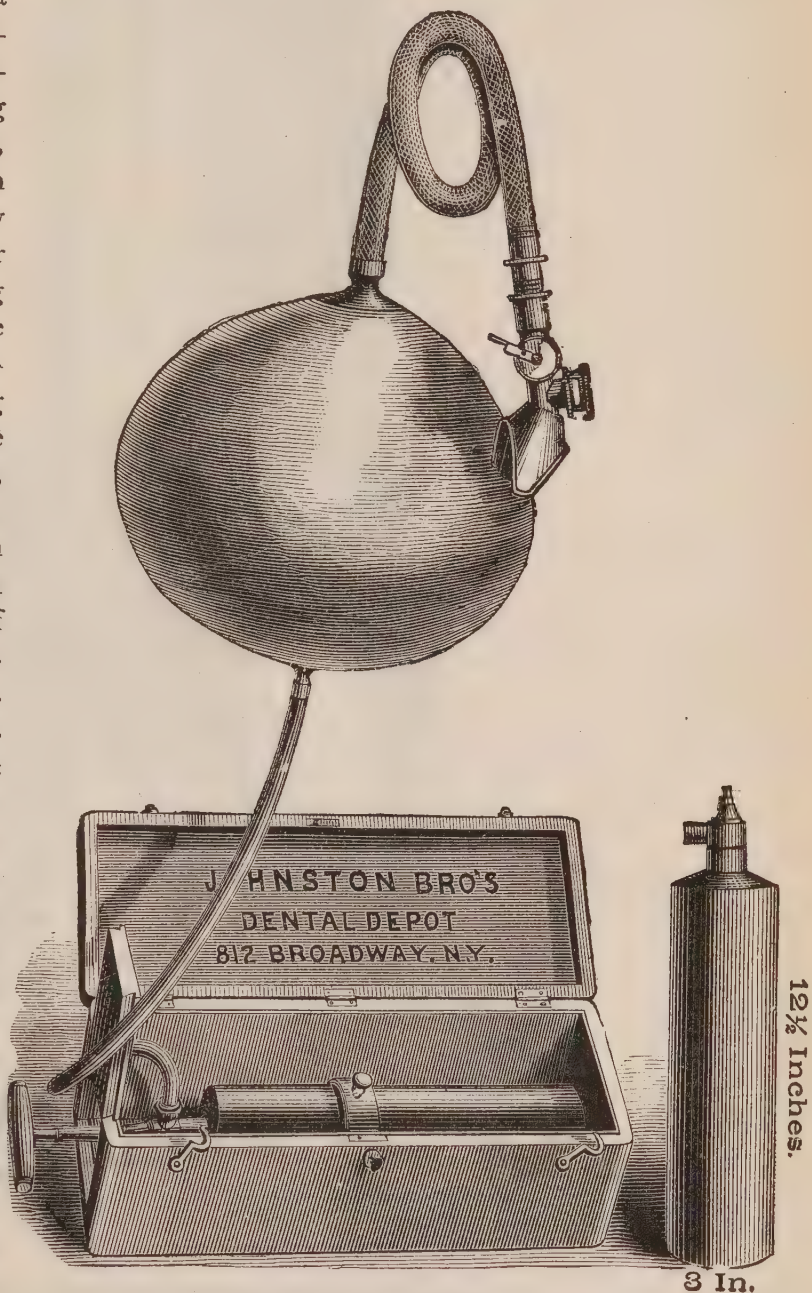
When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

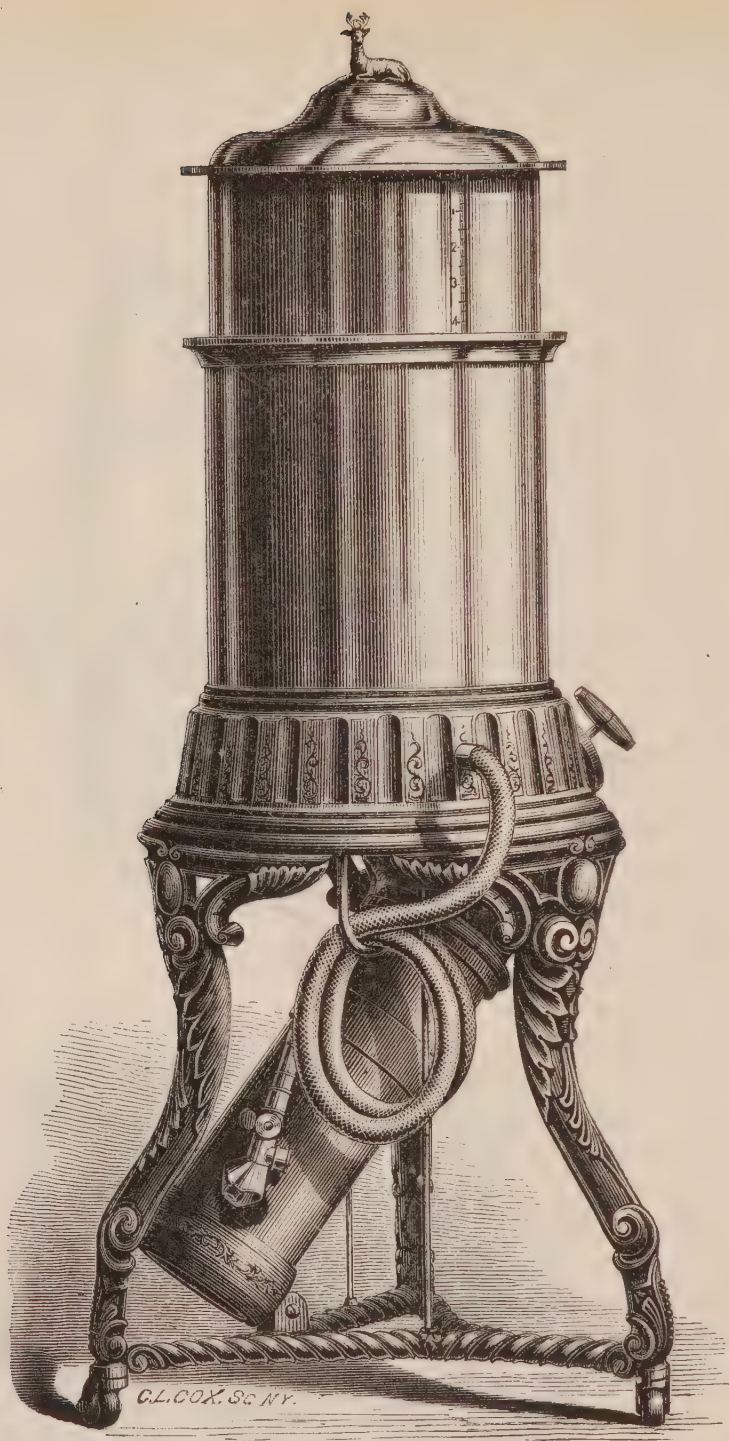
Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers



SURGEON'S CASE.

without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



NICKEL-PLATED GASOMETER

AND ORNAMENTED STAND

FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas—this is sufficient to completely anaesthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anaesthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality*.

JOHNSTON BROS., 812 Broadway, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler..... **No. 1**....\$42 00

Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic Inhaler..... **No. 2**.... 45 00

Boxing either, \$1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas..... 16 00

Refilling Cylinder..... 6 00

Nickel-Plated Gasometer, with ornamented iron stand..... 128 00

Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered Tubing)..... 12 00

1000 Gallon Cylinder..... 36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of $4\frac{1}{2}$ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at $4\frac{1}{2}$ cents..... 45 00

Morocco covered case, with ring and thumb screw, velvet lined..... 12 00

Polished bl'k walnut “ “ “ “ “ “..... 13 00

Or these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity)..... 5 00

Rubber Bag, with covered inhaler tubing, extra size..... 7 00

Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection..... 9 50

Key, Nickel Plated..... 1 50

Wrench, “..... 50

Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag..... 1 50

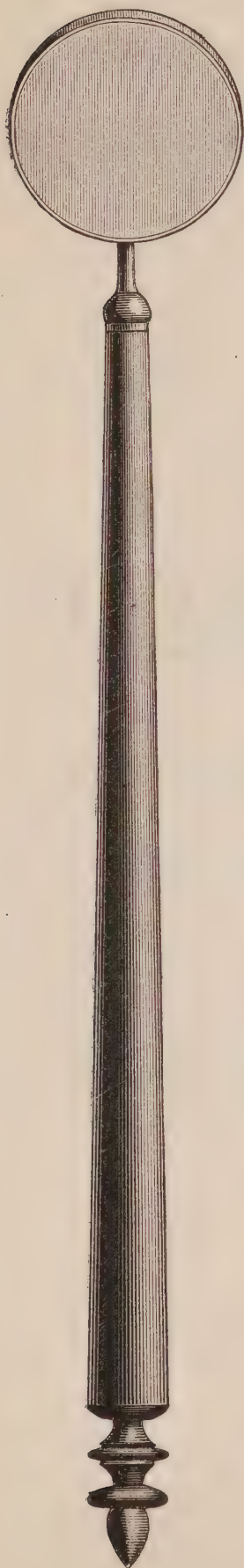
Covered Inhaler Tubing, per foot..... 50

Plated Connection to fit old style Inhaler..... 1 00

JOHNSTON BROS.,

812 Broadway, N. Y.

MOUTH MIRRORS.



Our own make—thoroughly tested. They are first heavily coated with silver, then protected carefully by a deposit of copper, as are the imported glasses known as “the imperishable,” then mounted in a nickel-plated frame.

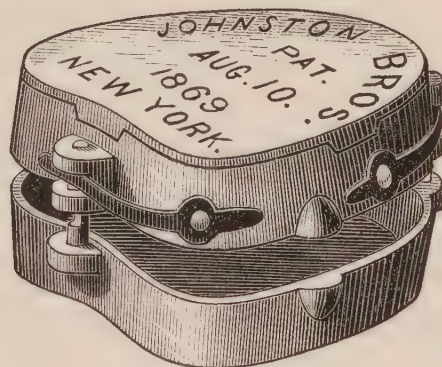
PRICES.

Plain, with ebony handles, $\frac{1}{2}$ to 1 in. diam.	\$1.00
Magnifying, “ “ “ “	2.00
Plain, with ivory “ “ “ “	2.50
Magnifying, “ “ “ “	3.00

JOHNSTON BROS.,
812 Broadway, N. Y.

SELF-LOCKING FLASK.

(PATENTED.)



This flask has been long tested with celluloid in actual use. It may also prove useful in rubber work, in which case it should be closed before being put into the vulcanizer.

POINTS OF MERIT:

1st. By its use one obviates the necessity of waiting to cool his heater before proceeding with a second case, since, when the flask is once closed, it locks itself, the screw may be loosened up, and the case and can be immediately removed from the heater.

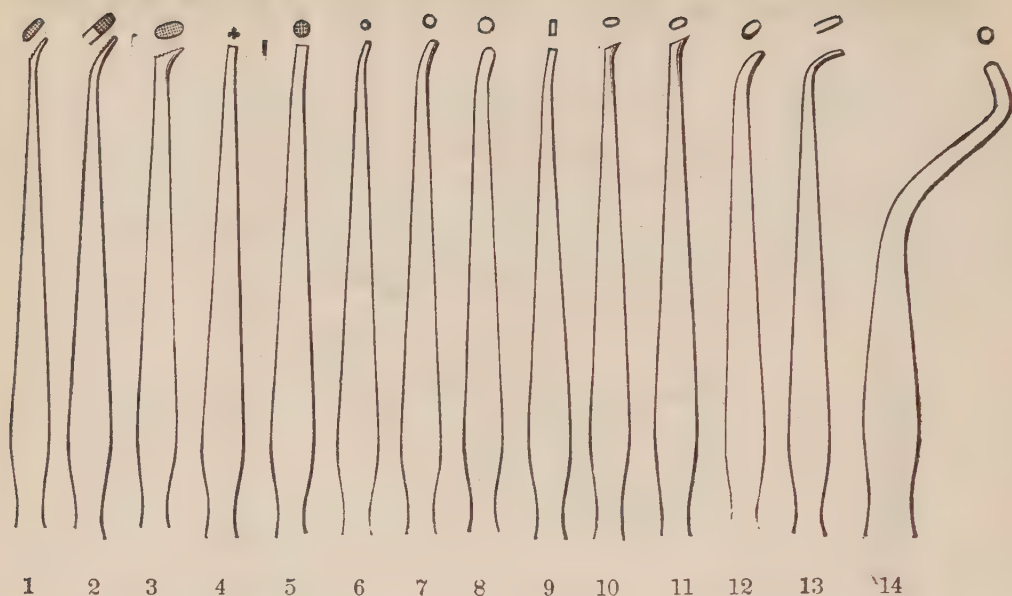
2nd. The click made by the spring as it drops into its socket announces that the flask is closed and the piece cured.

3d. This feature secures the dentist against the carelessness of an assistant, as should the flask fail to close, the fact could not escape his attention.

PRICE.

Brass\$2.50

JOHNSTON BROS.,
812 Broadway, N. Y.



Brockway Pluggers.

The points of this unique set of instruments are pictured above.

The set embraces finely serrated as well as smooth points, which latter form predominate. A peculiar feature of the set is, that only points of the same kind have handles alike in shape or color, and even each of these has some mark by which it can be distinguished from its fellows of the same style but of a different size. Instruments of each shape have a handle peculiar to that shape, so that the operator can, at a glance, recognize the particular instrument he may want.

Care has been taken to adapt the weight of each handle to the size of the point ; also in every form of instrument to avoid all sharp angles, which might cut the gold.

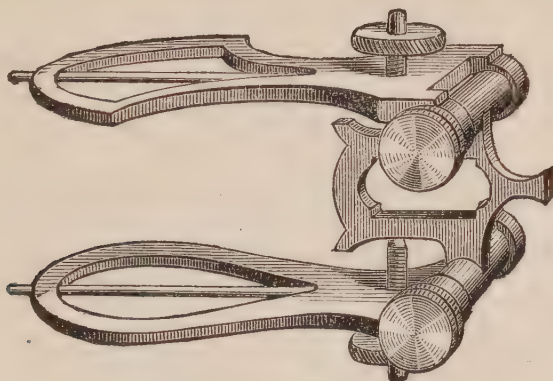
PRICES.

Per Set.....	\$12 00
Nos. 1, 2, 3 and 14.....	Each 1 15
Nos. 10, 11, 13.....	" 90
Nos. 4, 5, 6, 7, 8, 9 and 12.....	" 70

JOHNSTON BROTHERS,

812 Broadway, N. Y.

ELLIOTT ARTICULATOR.



Price \$3.00.

Points of Merit in the Elliott Articulator:

BY W. S. ELLIOTT, D.D.S., M.D.S

1st. Mechanical simplicity.

2nd. Impossibility of disarrangement of *bite*.

3d. Easy adaptation to all cases.

To use it observe the following DIRECTIONS: Next after the bite has been taken, turn the jaws of the Articulator each upon the other, forward or backward, according as you have a close or wide articulation, at the same time turn the set screws back so that they will be entirely free, when it will be observed that either jaw can be thrown *endwise*, forward or backward at pleasure. Set the cast upon either jaw and adjust the other to the most desirable position. Secure with a very little plaster; when *set* turn down the screws until they touch the inner frame. The entire arrangement is now firm and immovable, except the *open and shut*.

Trim the plaster closely and neatly to the jaws. If it is desired to remove the model, seize the projecting end of the central steel wire, withdraw it, when the model can be removed with ease.

JOHNSTON BROS.,

812 Broadway, N. Y.

ENGLISH PINK RUBBER.

We offer 1 x <i>pink</i>	\$8.00 per lb.
I	8.00 "
White.....	6.50 "
Black.. .. .	3.50 "

JOHNSTON BROS., 812 Broadway, N. Y.

FLOSS SILK.

We offer a fresh lot of unsurpassed quality as regards strength, uniformity and fineness of fibre. Each spool contains twelve yards.

Price per spool.....	.15
Price per dozen.....	.\$1.50

JOHNSTON BROS, 812 Broadway, N. Y.

NEW YORK COLLEGE OF DENTISTRY,

1876-77.

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C. P. KREIZER, M.D., Assistant to the Professor of Chemistry, Materia Medica and Therapeutics.

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Monday, October 4th, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions...	\$150.00
For the Course of Lectures only.....	100.00
Matriculation	5.00
Graduation Fees.....	30.00

Board may be obtained for from \$6 to \$8 per week.

For further information, address

FRANK ABBOTT, M.D., Dean,

12 West Nineteenth Street, New York.

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Dental Department.

BOSTON, MASS. 1875-76.

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The Ninth year of this School begins on the 28th of September and continues till the last Wednesday in June. The distinction of Summer and Winter sessions being hereafter abolished. It will be divided into two equal terms, with a recess of one week at Christmas. The course of instruction will be progressive, extending over two years, the lectures of one year not being repeated in the next.

The regular examinations will be held in the following order, viz.: At the end of the first year, anatomy, including dissection, physiology and general chemistry. A certificate from the demonstrator of anatomy will be required of each student, that he has satisfactorily dissected the three parts of the body.

At the end of the second year, dental pathology, including a knowledge of gestation and diseases of women so far as they affect the mouth and throat, dental materia medica and therapeutics, oral surgery and surgical pathology, operative and mechanical dentistry. The examinations in operative and mechanical dentistry will include actual operations and the preparation of specimens of mechanical dentistry.

Every candidate must be twenty-one years of age, and of good moral character; he must give evidence of having studied medicine or dentistry three full years; he must have spent at least one continuous year at this school, have presented a satisfactory thesis and have passed all the required examinations.

The University Degree, D.M.D. (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfil the requirements.

Students may be admitted to advanced standing upon passing a satisfactory examination in a majority of the studies already pursued by the class; but no student shall advance with his class or be admitted to advance standing until he has passed such examination.

The work in the operative and mechanical infirmaries will go on throughout the course, but no student shall be permitted to operate at the chair until he has by observation and practice on extracted teeth satisfied the Professor of his fitness.

The faculty recommend young men who propose to take the degree to spend the whole of the required term of three years of study in the school. But those who wish to spend but two of the three years in the school are earnestly advised to pass their first year of study, before entering, under the direction of a *competent* private instructor.

Unsurpassed facilities for operative and mechanical practice are furnished by the infirmary of the Massachusetts General Hospital which is open throughout the year.

FEES.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is \$200; for the second year, \$150; for any subsequent year, \$50.

For further information address,

THOS. H. CHANDLER, Dean,

222 Tremont Street, Boston, Mass.

PHILADELPHIA DENTAL COLLEGE,

Nos. 108 and 110 N. Tenth Street, above Arch.

FOURTEENTH ANNUAL SESSION, '76-'77.



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ALONZO BOICE, D.D.S., Demonstrator of Mechanical Dentistry.
J. FRANKLIN WARDWELL, Assistant Demonstrator.

THE DISPENSARY and Laboratory open all the year.

Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June. *Fall Preliminary Lectures*, commencing Monday, September 4th, will continue daily until November. Like the Spring Course, their object will be to anticipate subjects presented during the Winter Session. *The Regular Winter Course* commences Monday, November 6th, and closes on the last day of February ensuing. Three hours of each day will be devoted to attendance upon lectures, which will be illustrated to the fullest extent by a large and valuable collection of Chemical and Philosophical apparatus, and Anatomical and Pathological specimens. Tickets for the Course, including the Demonstrators', \$100; Diploma, \$30; Matriculation (paid but once), \$5. For further particulars address

J. H. McQUILLEN, Dean, S. W. Cor. 21st and Arch Sts.

T H E
MISSOURI DENTAL JOURNAL,

HENRY S. CHASE, M. D., D. D. S., Editor.

VOLUME VIII.

The Publishers of the Journal, being desirous of extending its circulation to the fullest possible extent, will send specimen copies to any part of the world on receipt of the address of dentists wishing to examine it. Address

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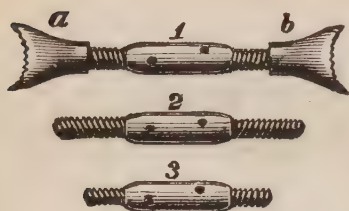
ST. LOUIS, MO.

DENTAL DEPOT.

Send for New Illustrated Catalogue.

JACK SCREWS.

Devised by Dr. C. S. LONGSTREET,
with Dr. A. McCOLLOM's Im-
proved Head.



This device is greatly prized by
those who have used it.

PRICES.

Full Set, as above, Nickel Plated,
screw and two extra bars...\$2.50

Jack Screw, Nickel Plated.....1.50

Bars, " " 50

Improved Triplex Rubber-Dam Punch.

Devised by Dr. F. W. DOLBEARE.

TWO STYLES, Nos. 1 and 2.



1st. It has in convenient
form for use three sizes of
punches.

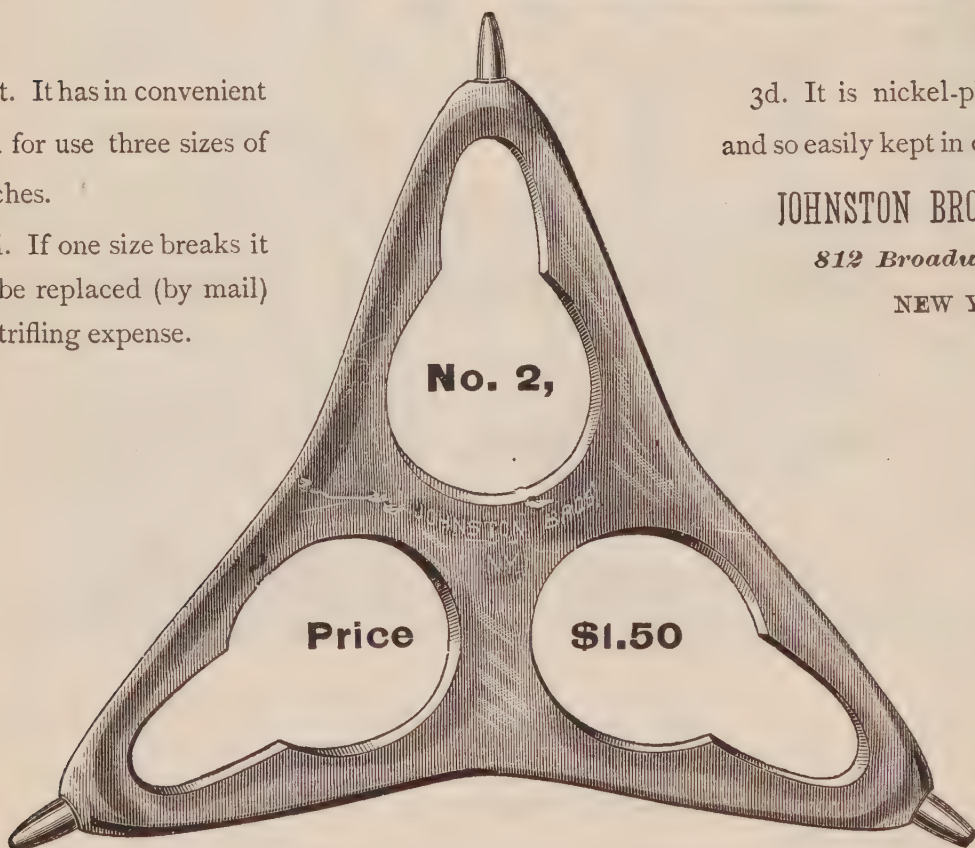
2d. If one size breaks it
can be replaced (by mail)
at a trifling expense.

3d. It is nickel-plated,
and so easily kept in order.

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NEW YORK.



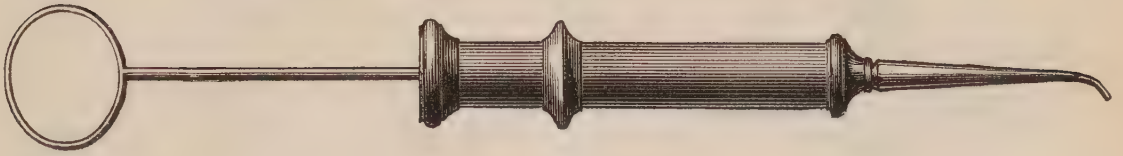
SECOND-HAND CHAIRS.

Dentists who have supplied themselves with the Morrison Chair, frequently request us to sell the chairs previously used by them. We therefore can ordinarily supply, at cheap rates, second-hand chairs of any of the varieties hitherto most used. For particulars, address

JOHNSTON BROS.,

812 Broadway, N. Y.

SYRINGE.



This syringe, of metal, nickel-plated, is represented half-size. It is provided with a spring, a suggestion from Dr. A. H. Brockway, so that if after use it is placed in water its piston rises and it fills itself with water, and is so constantly ready for use.

The points, straight and curved, are removable at will.

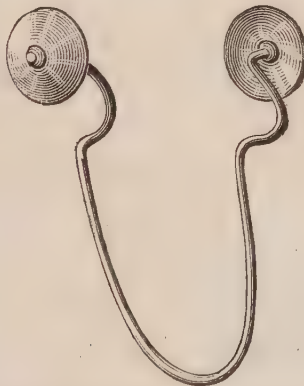
PRICES.

With one point, curved.....	\$2 25
With two points, one straight and one curved.....	2 50

JOHNSTON BROTHERS,

812 Broadway, New York.

Elliott's Cheek Distender.



Cut is $\frac{1}{4}$ size.

This convenient device, as its name implies, is designed to distend the cheeks of a patient during operations on the teeth.

Its bow of spring wire, and the cheek pieces are polished and nickel plated. It serves, in connection with its principal use, to reflect light on the teeth. As the spring is not stiff it is worn with very slight inconvenience. *This is proving extremely popular.* Price \$1.00.

JOHNSTON BROS.,

812 Broadway, N. Y.

American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

Price of Lathe, with two Chucks, - - - \$18 00

“ Chucks, extra, - - - 15

 No charge for Boxing.

SNOWDEN & COWMAN,

86 W. Fayette Street, Baltimore.

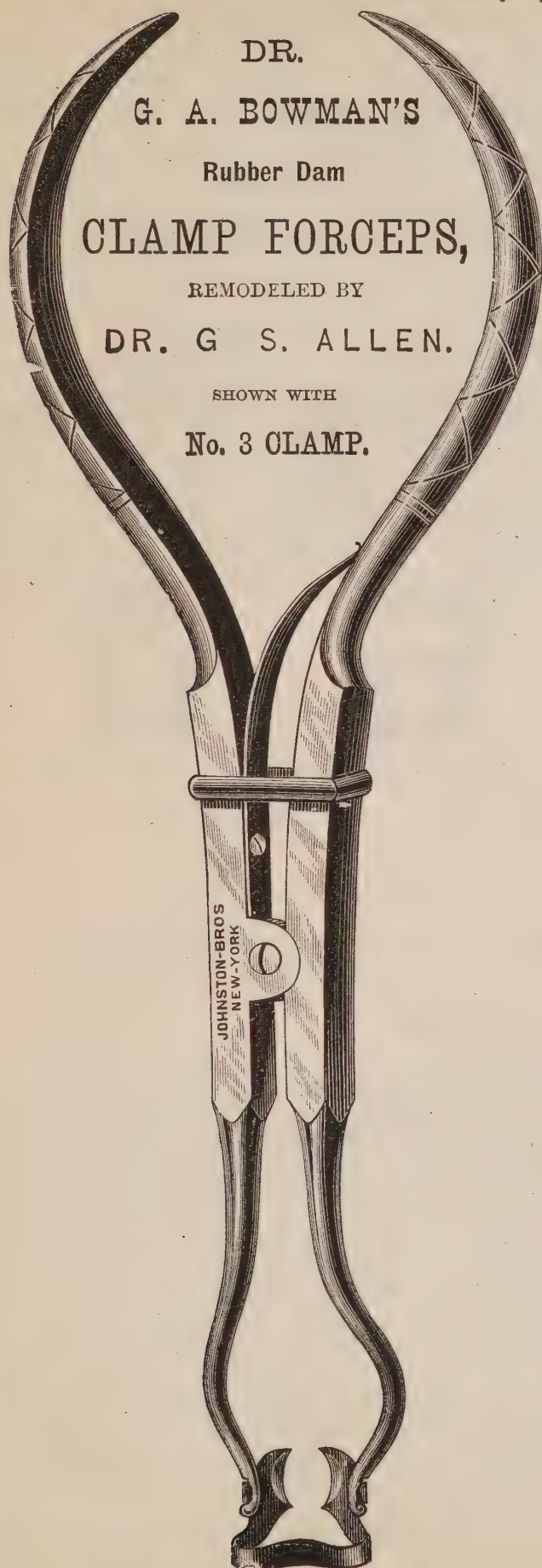
For Sale by

JOHNSTON BROTHERS,

812 Broadway, New York.

RUBBER DAM CLAMP FORCEPS.

Of these we offer two styles, both deservedly popular.



POINTS OF DR. T. C. ROYCE'S Rubber Dam Clamp Forceps,

Shown with Clamp. Handles are exactly like the other style, (Bowman's.)

Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

If so ordered we can supply either style of Forceps with a band, which will keep the Forceps and Clamp extended and ready for use when the hand of the operator is removed, as shown on the Bowman Forceps.

PRICES.

Forceps, either style	\$3.00
“ “ “ Nickel Plated....	3.50
Complete set of Clamps, embracing eight forms.....	4.00
Complete set of Clamps, embracing eight forms, plated.....	4.80
Clamps, each.....	50
“ plated.....	60

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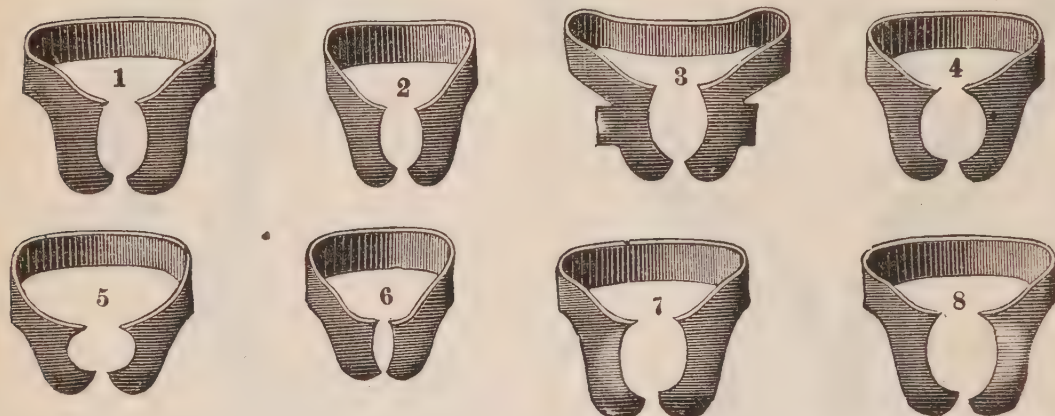
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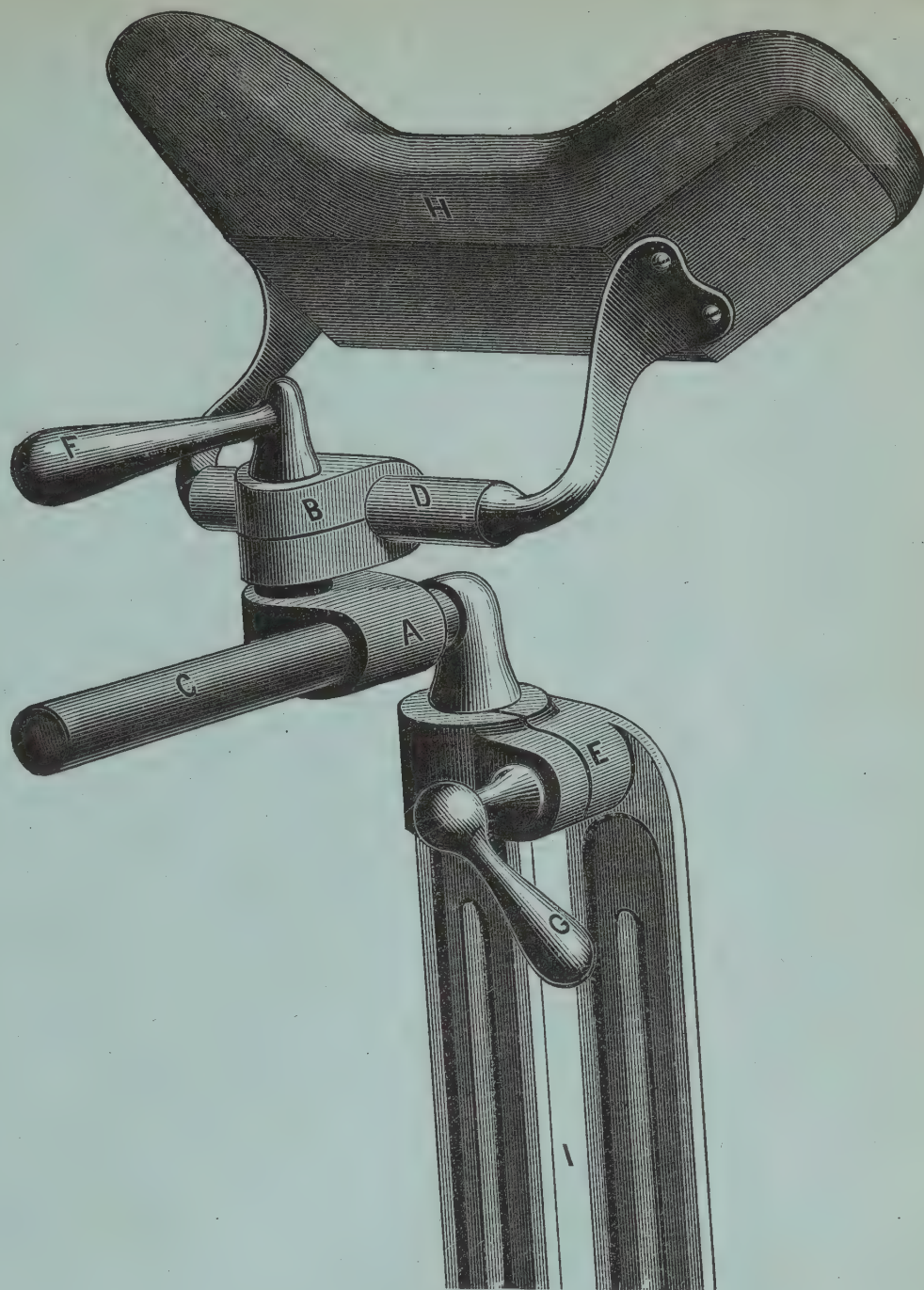
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Johnstons' Dental Miscellany,

A MONTHLY JOURNAL OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

NOVEMBER, 1876.

NEW YORK:
JOHNSTON BROTHERS,
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JOHNSTON'S DENTAL MISCELLANY,

FOR 1875.

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JOHNSTONS'

Dental Miscellany.

VOL. III.——*NOVEMBER*, 1876.——No. 35.

HOW BEST TO ESTABLISH A DENTAL PRACTICE.

BY DR. E. G. WHEELER, Mobile, Ala.

It is said of the poet that he is “born, not made.” To some extent this sentiment is true of the dentist ; for there is constantly such a demand for that kind of ability which promptly discovers the relation of cause and effect, and intuitively discerns the shortest and best means to accomplish a given end, that the possessor of such a genius starts out with superior advantages to one who has it not. But since it is also true that he who runs swiftly does not always win the race, I would say to every one who has a sound mind in a healthy body, “God speed.” The success of many who have had no better capital than this to start upon, is before us for our encouragement ; for it generally needs but a judicious arrangement of the materials with which nature has furnished us, duly fashioned by science and art, to construct a specimen of dental architecture praiseworthy to the architect and honorable to the profession.

It gives me peculiar pleasure to review the past and to record the conclusions of a somewhat extended experience, and no little observation, with the hope that it may benefit some one whose professional life is scarce begun ; for it is wisely ordered that in the progressive development of man, the experience of individuals may be communicated to others, and as we have profited by the wisdom of the past, so our successors may gather instruction from the records we leave behind.

First, what is success, or the objective point which the aspirant

should keep ever in view? for life is insipid without an object, and the more clearly defined it stands out to our earnest gaze, the steadier will be our race.

Avarice defines it *wealth*, and would award the crown to him who has stocks and bonds, houses and lands to exhibit as the reward of his toil. There is such a fascination in display, such an attractiveness in the ease and comfort which wealth sometimes brings, that it is hard to frame an argument to prove it unworthy of our highest ambition; and yet when it becomes the supreme object, it may be linked with charlatanry and dishonesty; qualities which generally defeat the end in view, though sometimes so skillfully played as to deceive those whom they defraud. Surely, then, this cannot be success, neither can it be found in any other object concentrated in self. The true dignity of our profession presupposes that we are not altogether selfish, but that we, in common with our medical brethren, labor to relieve the distressed, to palliate, and, if possible, heal the maladies incident to humanity—to search out from the hidden mysteries of nature, laws which govern health, that disease, and consequently pain and suffering, may be prevented. Such objects are incompatible with anything purely selfish, and as such they ennoble and dignify our calling.

The first element of success, then, is found in the energizing power of a high and noble purpose to sustain, and, if possible, to elevate a profession which has for its object not selfish aggrandisement, but the welfare of suffering humanity. This should be the mainspring to move the whole machinery of life, prompt every action and purify every impulse. In the sacred presence of such a principle, dishonesty stands abashed, and quackery hides her blushing face. It carries with it a moral power which sustains us when expectation fails, and reassures us when disappointment comes. Lay the foundation, then, of our architectural design, broad and deep in a just and proper conception of the scope and dignity of the profession.

Upon this basis the superstructure may securely stand, and let it be cemented with *Honesty*.

Not that honesty which is so from policy, for that is little better than galvanized rascality; but that honesty which is the offspring of a deep consciousness of responsibility—a principle that would scorn a mean action in oneself, and would surely expose deceit in others. The operator who is truly honest will not enter the field of action until he is fully instructed and properly equipped, lest those who confide in him suffer from his unskillfulness. He will never betray the confi-

dence of his patients by palming off a miserable counterfeit for the genuine article. It will lead him in examination to be accurate, in operations to be thorough and skillful, and in all his intercourse to give unfaltering allegiance to the dictates of an enlightened conscience. Such a principle discourages opposition, commands respect, and secures that confidence without which there is no success.

The foundation being laid and duly cemented, we are now ready for the superstructure, the materials for which will be found under the head of *Education*.

The average dentist of to-day is certainly an improvement over his brother of twenty or thirty years ago—an improvement more perceptible to one whose professional life spans that interval than to one who has recently germinated under the fostering care of his Alma Mater. Then an apprenticeship of a longer or shorter duration in a dental office was a legitimized entrance into the profession; to-day it but fits him for his college course. Then his curriculum was exceedingly limited; now it is greatly extended, embracing many collateral sciences. Then an educated hand was the desideratum; now an educated mind, which guides the hand, enlarges the comprehension, elevates the whole man, and renders him competent to grapple with the grand physiological and pathological questions which are constantly arising.

Education is the vital question of the day. It bears on its front the weal or the woe of future generations; for, in proportion as the standard is high, will be drawn into our professional ranks men of corresponding talents and capabilities, who will become its exponents, and in proportion as the standard is low will it be the resort of ignorance and stupidity. It is a grave mistake for any one to discourage the idea of a medical education being important as the basis of our specialty. I would go even farther, and say, better still that every candidate for the ranks of our profession could bring with him not only a thorough medical training, but also that discipline of mind which it is the province of our literary colleges to furnish; then would our institutions not be straitened for gifted teachers, or our literature for instructive contributors. We should then march forward with the proud stateliness of a thoroughly disciplined army to conquest and victory. Then we should have less need of legislative enactments to guard the portals of our profession, for ignorance and incompetency would shrink from a contact which would only reveal their deformity.

Is this ideal picture attainable? Whether it is fully or not, we shall be found marching in that direction, if we but inspire each new candi-

date for professional honors with the laudable ambition to become a standard-bearer, personating the beautiful conception of our honored poet, as he mounts the Alpine crags of error and ignorance, bearing aloft his unfurled banner, inscribed "Excelsior," until it be planted on the eternal rock of truth, and in the full sunlight of an exalted pre-eminence.

The discussion of this question cannot be otherwise than productive of good. Already we can see the crest of the incoming wave of popular opinion, demanding a superior quality of work and a more intelligent treatment. The revolution has commenced, and happily revolutions never go backwards.

It is not impossible that we who are now upon the stage of action may in the future witness a substantial advancement in our professional status, in respect of education, which will astonish us still more than the past.

It has been the writer's pleasure for three years to attend the regular lectures of a medical college, and in response to the oft-repeated inquiry, "cui bono?" the answer would come impromptu from a heart grateful for the opportunity: the *good* of those who favor me with their patronage; the *good* of the profession which claims my energies and my affections.

Let him who would *best* build up a dental practice heed the maxim, "knowledge is power." A superior knowledge of dentistry as a specialty gives him eminence among dentists; but if, added to such special training, he has the broader culture of the physician, the medical fraternity will show their affinity for him by giving him admission to their counsels, consulting him in cases of oral surgery, and by throwing around him generally the ægis of their protection; and who can estimate the power of their patronage and their influence?

What is meant, then, by a dental education, is the very largest amount of physical and mental culture possible, sufficiently comprehensive to cover the broad foundations upon which we are building.

Our structure thus far has more of solidity than beauty. It needs ornamentation to give it attractiveness. A finished and classical style of architecture demands columns and cornice of height and strength proportionate to the edifice. These we shall name *Diligence* and *Thoroughness*.

The best instructor in wisdom has said, "The hand of the diligent maketh rich," and again, "Seest thou a man diligent in business, he shall stand before kings, he shall not stand before mean men," and

observation teaches us that he who would reap the reward must endure the toil. The veteran who has achieved success may occasionally lay his armor down and rest from his toils, not so the youthful warrior whose laurels are yet to be won. A dental practice is built up by a gradual accretion of patients. Each well and thoroughly treated patient brings another, and that other a third, and so on progressively until the office hours are filled. The same rule holds good in retrogression. A neglected patient communicates his disappointment to another, a third listens to the story of inattention, and they all seek elsewhere for one whose systematic diligence can be relied upon. There is a feeling of security in trusting one who is always found at his post. It is a Spartan quality which carries with it the assurance of kindred virtues, which together make up the supporting columns of a reliable and substantial character.

Of equal importance is thoroughness. The sod of the valley oftentimes conceals the errors of the physician; not so with the dentist, for as the entablature of a Grecian temple proclaims from afar the merit or demerit of the architect, so the very conspicuousness of our work makes it noticeable by the most casual observer. A want of thoroughness proclaims its own defects, and sooner or later will react with terrible effect upon its author.

It should be the aim of every practitioner to make each new operation superior to the last, constantly pressing forward towards a higher mark; grasping the idea that mediocrity may be excusable in a beginner, but unpardonable in the experienced. The habit once acquired will not easily be neglected; for, like other virtues, it has its own reward in the pleasing satisfaction of increasing excellence, and in the well-merited praise of those who are its beneficiaries. In a profession where there is such an opportunity for æsthetic display, such scope for skillful manipulation, it is the height of venality to have no weightier motive than paltry gain. It is to descend to the rank of a hireling, when the honor of the master is within our reach. I would then charge him who builds, that no matter how perfect or abundant the materials, nor how elegant the design, if there is a want of thoroughness in their adjustment the structure will surely crumble to the ground, and remain a monumental pile to the disgrace of the ignoble architect.

Our design approaches completion, but the elegancies of modern taste require the display of frescoes, mouldings and tapestry. These we name *Courtesy*, a Christian grace, by which the angularities of character are toned down into symmetry and beauty, just as barren walls and gloomy recesses acquire gracefulness from artistic decorations.

Courtesy often wins its ways to success, even when there is a woeful deficiency of true merit ; but when it supplements a character already meritorious it becomes invincible.

There are many reasons why the dentist should especially cultivate this quality. His practice brings him into intimate relations to the weaker sex, towards whom courtesy is always due, and particularly so when they place themselves under his care, trusting to his gentlemanly bearing for kind and respectful treatment. Under such circumstances it is inexcusable grossness to offend, by word or act, that delicacy of feeling which belongs to them by intuition ; besides, the very nature of the services performed are often a terrible tax on their powers of endurance ; it is then of more importance that our conduct should not increase the sufferings which are unavoidable.

Every practitioner is to some extent the guardian of our professional honor, and as such he is bound by all the rules of justice and propriety to maintain inviolate a reputation for courtesy, lest he reflect dishonor upon his associates. Sir Walter Raleigh by a single act of polite gallantry won the notice and the patronage of England's proudest queen. Such opportunities are rare ; but each one may, by a studious attention to the essentials of good breeding, secure the favor of those whose patronage is more constant than that of queens—increase his self-respect and honor his profession.

Another quality remains to be mentioned, which is equally necessary in a perfected edifice and a perfected character, viz., *Cleanliness*.

Wesley places this next to Godliness, and surely we should not estimate lightly what is second only to the essence of all good. There may not be any great amount of sin in soiled hands and unkempt hair, but there is an infinite amount of disgrace. Slovenly habits may not be a crime recognized by the civil code, but they have their penalties notwithstanding.

They are found in the disgust of the well-bred, the loss of patronage, and a general degradation of character. There are many fastidious persons who shrink from entering a dental office, and dread to think of, much more to see, the implements of the craft. To calm the agitation of such sensitive natures, cabinets should conceal the instruments from view, and when necessarily exposed they should bear no reminder of former service, but on the contrary, from their polished surfaces, appear beautiful rather than dangerous. We can hardly overestimate the importance of a pleasant office tastefully arranged and neatly kept, in calming the apprehensions of those who are so unfortunate as to need our

services. By such surroundings we shun the inquisitorial practice which, in the refinement of its maliciouness, first tortures the mind with horrible sights, and then racks the body. Habits of cleanliness are oftentimes the counterpart of inward purity, and if we would aspire to the fellowship of the virtuous and pure, we should at least give this proof of worthiness, by possessing and habitually practicing this most Christian virtue.

Let us pause a moment and view the structure thus far completed. The foundations have been laid in a noble purpose, cemented with honesty—we have reared upon it commodious apartments from materials furnished us by education. Before us rises the massive entablature of thoroughness—supported by the stately columns of diligence; within and without it is embellished with all the artistic beauties of courtesy and now swept and garnished it stands before us—but still incomplete. It lacks the lofty dome with its graceful curves to accomplish the design. Upon this we write *Consecration*, and as its pinnacle points heavenward, let it signify that all our talents and all our labors should be dedicated to God. Let him who builds catch the inspiration of worthy aims and pure motives from above—he then may rest assured that when the architect shall cease from his labors, his work will remain a beautiful temple to commemorate his successes and his virtues.

LETTER FROM SWITZERLAND.

MR. EDITOR:—To-day I have had an opportunity of examining some tin and gold (or gold and tin, as you like,) fillings that were made in August, 1874, shortly after the discussion on the subject in Geneva by the American Dental Society of Europe, at its meeting of that year. These fillings were made on the right side of the mouths, in the superior and inferior molars, in buccal and posterior approximal cavities. The teeth were soft and chalky—the kind that can be cut away in all directions—and doubt remains whether we have reached the true solid *border* of the cavity or not. In all these cases the fillings have turned inky black, but decay has not progressed. With the statement so far, a dentist might believe that this combination of metals, tin and gold foils in one cavity, has really some virtue for the preservation of soft teeth. The American dentists of North Germany have certainly great faith in the

filling, and have advocated it earnestly. The other half of the statement which I wish to make is, that on the other half of the same mouths, and in almost similar and equally difficult cases, I at the same time, *i. e.*, August, 1874, employed tin foil alone, and to-day, when my morning and afternoon patients presented these fillings, I find the teeth equally well preserved with the tin foil, and these fillings have not oxidized to the same extent. They look much cleaner, and, as the Swiss say, more appetizing. In regard to the introduction of tin and gold, or tin alone, or non-cohesive gold, I do not consider the variation in the degree of force necessary to consolidate worth speaking about. In nearly all cases where I have applied tin and gold I have considered it an experiment, and have employed tin alone in the same mouth, for the advantage of comparison. Thus far I can safely say the balance of favor lies with tin alone, on account of color. If there is practically advantage in having two metals to occupy the chemical or electrical forces in a tooth, I should think a superior method of operating in large and difficult cavities would be to employ amalgam about the walls, and when set, fill the centre or the part that is exposed to view, with gold. It would do as well and look better. Dr. Chase offers the plan of lining the cavity with tin and then filling with gold. Dr. Abbott, however, unites the gold and tin in a rope, and claims that a process similar to amalgamation takes place between the metals after a time. The objection to the combination is certainly the color, and a casual observer would certainly pronounce a fine large filling of tin and gold one year old to be an amalgam of *silver coin* and not very *pure* mercury. If blackness of color is necessary to the preservation of white, chalky teeth, a tin filling or an amalgam filling can be well blackened by penciling lightly with nitrate of silver in solution. After two years of observation and recorded experiments, I think tin alone or gold alone as good if not preferable to the combination of them in one filling, and in cases where a good tin or a good gold filling is impracticable on account of the inability to control the patient or other causes, that a good amalgam filling will do duty. If we could employ gold and tin, and retain the color of either with the accredited advantages of electrical benefits, we might have occasion to rejoice; but the midnight blackness of the combination makes a dentist feel that it is pitch, and perhaps a pitch that will defile him as well as the tooth.

C. M. WRIGHT.

Basel, Oct. 24, 1876.

TREATMENT OF EXPOSED PULPS.

By W. S. ELLIOTT, D.D.S., M.D.S., Goshen, N. Y.

This subject, upon which so much has been said and written, would seem at this time to offer but little claim upon our thought or consideration. Yet, in my own mind, I am assured that there is a significance which lies deeper and which is of more essential importance to us as scientific practitioners than that more commonly enunciated.

Successful practice is the culmination of scientific dicta, whether the special features of that science be comprehended or not ; and since our attention is usually called to the manipulative or practical aspects of the subject, and seldom to its philosophy, I opine that the latter is less understood than the former. I moreover feel that this is eminently true, since successes are so often ascribed to such circumstances as are merely incident to or attendant upon the more ultimate features embraced in the deeper and more profound comprehensions.

As practitioners the mind should embrace all the elements, scientific and philosophic, that surround our efforts, for advantage can only be taken of the laws, which are inevitable in their workings, by knowing them and knowing their tendencies. Thus one may learn the possibilities and more boldly accept the probabilities which may be presented.

To cite cases of success which refer only to the manipulative features of the operations affords but a limited guidance to the inquirer, since a similar procedure will often fail in instances where different conditions exist, but which are not duly recognized.

It is our purpose, then, to look beyond the merely practical, and learn, if we can, the whys and wherefores of our acts, that our judgment may be the more correct in every emergency.

In the treatment of an exposed pulp varied pathological conditions may be evidenced, but to make ourself better understood we will accept a case which presents no formidable complications, as thus we will be able to fix upon a standard of physiological process which will become our guide under more adverse and trying circumstances.

The prognosis is of course favorable ; at the same time it is evident that a comprehensiveness on the part of the operator is demanded which will guide his hand and judgment to a proper fulfillment of

his duty. He must estimate the true vital condition of the parts, and, as fully as may be, entertain the processes which serve to maintain the tissues in their functional activity. He must learn the possibilities of nature in her efforts to restoration; then will his practice become a rational one, and he will leave little to the chances of methods instituted in ignorance of the laws referred to.

Caries of the tooth substance, and consequent exposure of pulp, are in themselves pathological conditions; but without consideration of the danger of provoking more extensive disease the matter indeed would be simple enough, for then it would resolve itself into a mere mechanical operation of filling the cavity. Experience, however, teaches us that the pulp tissue is usually intolerant of the presence of foreign substances, and is so in proportion as the physical nature of the substance varies from the physical nature of the tissues; yet it is evidently necessary that the pulp should be shielded from such undue influences as would result disastrously. Persistent experimentation has established the conviction that in a very large proportion of cases the pulp can be saved in a perfectly healthful condition, though it would seem that these favorable results have not been attained to so much through scientific deductions as by empirical practice. Every success establishes the concurrence of correct principles, though such may not be fully recognized and appreciated, but which, if so appreciated, would enhance the result to almost a maximum of possibilities. Let us try, then, in an humble way, to unfold these principles, and clothe the observed facts with their true scientific vesture.

The pulp in its structural aspects is a conglomerate mass, made up of circulatory vessels, nerve fibre and connective tissue, all enclosed within the space bounded by the investing membrane, and again by the wall of dentine. These several parts are nourished by the appropriation of pabulum from the blood according to the requirements of each while in their due balance of health, and the selection is further made with a certain degree of variableness in proportion to the demands under any special circumstance or condition which is not excessive or sufficient to the arrestation or perversion of function. Now, while it is asserted that the supply of the nutrient elements is furnished by the blood, it must not be forgotten that there exists also on the part of the tissues themselves certain peculiar capabilities for the elaboration of material, not for their own maintenance, but to meet the increased demand in the reparative process. This is an important consideration, which we will have occasion to refer to again.

Exposure of the pulp means a denudation of the peripheral membrane or a more extended lesion involving the deeper vessels and nerve tissue, whether this is occasioned through a chemico-vital disintegration of dentine or through mechanical violence.

The tooth pulp, as in the case of any tissue, when traumatically injured must be repaired through a physiological process ere its normality can be pronounced. The question then arises, Can we favor this process by interference? It is conceded that this is possible; but if any attempt is made in this direction we certainly must study well the minute features of that process, that our interference shall not utterly defeat the end to be attained. We cannot, therefore, be content with the general characteristics of the pulp as already referred to, but must be impressed with its histology and note particularly the office of each distinctive tissue in its own sustentation or in the act of reparation.

The membrane enclosing the pulp is a transparent structureless tissue (the preformative of Raschkow), which contributes to the maintenance of the dentine in its structure and function. The arterioles are, of course, the channels through which are conveyed the aggregated blood pabulum, and the venoles the conduits of the débris of nutrition. The nerves are the media of excitation and reflexion, through which are conveyed the dynamical forces which find their expression in vital activity and sensational consciousness.

Here we will reiterate the important fact that the office of any organ during a state of healthfulness is not identical with its capabilities under certain pathological conditions; for instance, it is not the office of the periodontium to invite to itself the calcareous salts to the production of exostosis, or of the pulp-membrane to the formation of secondary dentine. That each organ is capable of performing this excess of function seems very evident from observed facts, but it is only under the influence of unusual stimuli that this capability is made apparent. This superlative tendency, it is conceded, is confined to the tissue in which the phenomenon is manifested; but such tissue necessarily has its limitations, beyond which no persistency of effort will avail. Stimulation must therefore be moderate, else the primary office of the discerning organ will be impaired through exhaustion, and normality thereby compromised. Over-stimulation amounts to irritation, and irritation leads to depressed vitality, inflammation and death.

Let us now call to mind the constitution of the blood, for from this is selected the material for the repair of the lesion.

There are, as we know, four principal components, viz. : Fibrin,

albumen, salts and corpuscles. The first of these is the special pabulum of connective tissue. Albumen is one of the most important constituents, since it bears a fundamental relationship to all the other elements, and at the expense of which the solid tissues are generated. It is destitute of formative capacity, but enters into the structure of the tissues by assimilation and as a reserve store in the various transformations. The salts are composed principally of the phosphate and carbonate of lime, fluoride of calcium, silica, and the phosphate and carbonate of soda. Of the corpuscles we have the red and white in varied relative proportions, either variety possessing peculiar structural and chemical properties. These several constituents of the blood are suspended in the water or serum, whereby they are made capable of penetrating to the remotest territory of the living organism ; thus the system is nourished and supported through its allotted time in all its integrity of healthful being. But now we are to study its characteristic features under other circumstances. Let a portion of blood be drawn into a vessel, and soon we will perceive a marked change in its properties. It does not maintain that homogeneity and fluidity common to it while circulating in the living body. The constituents are disposed to separate ; the fibrin coalesces and appears on the surface, and the corpuscles gravitate towards the centre of the mass. We have here presented a *clot* or *crassamentum*.

We note this peculiar tendency of the blood because precisely the same phenomenon is exhibited in nature's first step towards the repair of traumatic lesions. When blood is drawn and left to coagulate upon the living parts the act is sometimes tardy, owing to the fact that the various surrounding circumstances are such as to favor its fluidity ; therefore in the case of a wounded and bleeding pulp it is not wise to wait entirely upon this tendency, but to institute such helps as have come to our knowledge.

I will not presume to speak of the innumerable experiments made in this direction, but will make reference to that method which seems to have proven the most successful, namely: the direct application of creosote to the point of exposure. By its presence and through its peculiar influence the fibrin as well as a portion of the albumen—which are nearly identical in their constituent properties—are instantly arrested, and a white pellicle is made to appear upon the surface of the pulp.

The fluidity of the blood is maintained by the presence of the phosphate and carbonate of soda, whence also its alkalinity, and it is averred that if this alkaline condition be neutralized, coagulation will take

place much more readily. If, therefore, the creosote acts chemically it would seem to be in this direction, though I am inclined to the theory that other dynamical influences are equally concerned in the phenomenon. Admitting, however, that there is more or less chemical affinity manifested, we are thereby assisted in our readings by the recognition of the fact that the alkaline salts are held much more feebly by the fibrin than by the corpuscles; hence the fibrin is first precipitated, and as the affinity is thereby satisfied, the corpuscles are left wholly undisturbed in their functional capabilities.

The arrested fibrin now becomes the framework or matrix of the new structure. It does not enter again into the circulation, but remains as organized tissues, subject only to the ordinary disintegrative metamorphosis. Under these circumstances, can we not reasonably hope for a continuance of the process of reconstruction? The vessels are shielded from all ordinary vicissitudes by the coagulum, and are stimulated to a degree sufficient to promote the influx of healthy pabulum and its due assimilation. The physiological round of requirement is thus complete; a cicatrix produced, and a cure is established beyond the probability of relapse. Calcification follows in due order of time, to further shield the living pulp from any external influence.

Thus we have attempted briefly to note the general conditions upon which we would depend to ensure a successful issue in the treatment of an exposed pulp. It will be necessarily inferred that a quality of blood deficient in vital energy, or in its constituent properties, and which is therefore incapable of a healthful coagulation, would thwart our best efforts, and we would therefore be impelled to study the various conditions and dyscrasies of body, and to learn so far as may be the limit of possibilities in any given case. A proper diagnosis is therefore eminently essential, and too much thought or consideration cannot be expended in this direction. The predisposing as well as the direct causes of disease must be entertained, and every circumstance carefully weighed according to a judgment well matured by close observation and practice.

We lay no particular stress upon the treatment of the cavity of decay as such; this resolves itself into a mere substitution of the lost dentine by some material which has the quality of adaptability, compatibility and durability.

In connection with the above, I append a few quotations and references, which will prove of interest as regards the subject under consideration:

Dr. Carpenter: "The coagulation of the blood is not a proof of its

death, but is rather an act of vitality." * * "If the effusion of fibrin take place upon a living surface, its conversion into a fibrous solid is the first act in the production of solid tissue, which becomes a constituent of living fabric, for it seems absurd to maintain that the blood dies in order to assume a higher form."

Dr. Zwicky "has traced the successive stages of the metamorphosis of the coagulum into connective tissue, and the formation of vessels in its substance."

Mr. Paget: "Fibrinous effusions are much more completely converted into fibrous tissues *within* the living body and in immediate contact with living tissue than they are when removed from it."

CAUSES AND MECHANISM OF THE COAGULATION OF FLUIDS.—Messrs. Matthieu and Urbain have recently made some very important experiments upon the causes and mechanism of the coagulation of fluids, particularly of the blood, which they liken to a chemical precipitation. The transformation of the soluble to an insoluble substance is produced by an acid, whose effect is generally counteracted by the alkalinities of the fluid. The acid exists in none of the normal fluids of the body except the blood. They make the following points concerning it: 1. Carbonic acid is the agent in coagulating the albumen. It only does this at an elevated temperature because of the ammoniacal salts, which must be volatilized. Cold albumen, if deprived of its ammonia, will be precipitated by the acid. 2. Carbonic acid is also the cause of the coagulation of fibrine, and blood deprived of it is incoagulable. It cannot produce this effect, however, normally, because it is combined in the red globules, which have a great affinity for the gas. When the organs for its excretion, viz., the lungs and the skin, do not perform their function, the acid accumulates and produces intravascular coagulation; as, for example, in death by suffocation. By a similar accumulation beyond the limit of saturation of the blood globules in the case of ligature of a vessel, coagulation is produced. Venous clots are formed in the course of debilitating diseases because of a degeneration of the red globules and loss of power to hold the acid gas. 3. Cadaveric rigidity is produced by an accumulation in the muscles of this same agent, developed by the slow oxidation of the tissues. 4. The coagulation of milk is preceded by analogous processes to those which induce the muscular coagulation of *rigor mortis*; in the former case, however, lactic acid is produced, which coagulates the caseine at an ordinary temperature.

CAUSES OF THE COAGULATION OF THE BLOOD.—Glenard remarks, in a communication to the Journal of the Chemical Society, that when an arte-

rial or venous segment filled with blood is removed from a living animal and preserved in the air, the blood does not coagulate and the flesh dries to the consistence of horn. If in this condition the blood, which may have become wax-like or even pulverulent, be soaked in water, it dissolves, and the solution, even after filtration, is susceptible of spontaneous coagulation. The cause of the coagulation of the blood is found to be its contact with a foreign body, and so long as it is kept within its proper walls it remains unchanged. The coagulating influence of such contact with foreign bodies is less, the nearer the physical construction of the foreign bodies approaches to the physical construction of the vessels. Apart from the mere contact of foreign bodies, none of the conditions with which the blood is surrounded determine the coagulation. Neither the coagulation nor the fluidity of the blood is due to either excess or defect of any gas of a chemical nature. Blood preserved in its segment of vessel is revivifying so long as it remains fluid; the blood of an ox seven hours after its removal from the animal can be successfully transfused into a dog bled to extremity. The blood is alive so long as it is spontaneously coagulable. Coagulation is the death of the blood. Concentration of the blood prevents but does not destroy its coagulability; the addition of water restores the physico-chemical conditions necessary for it to coagulate spontaneously.

AMERICAN DENTAL ASSOCIATION.

MEETING OF AUGUST, 1876.

SECOND DAY—AUGUST 3D.

The American Dental Association re-assembled in second day's session August 3d, in the chapel of the Arch Street M. E. Church, Dr. A. L. Northrop, President, in the chair. Reports were called for from one or two committees, but their reports not being fully prepared, and additional time asked, it was granted. Dr. Frank Abbott, of New York, Chairman of the Committee on Operative Dentistry, reported, giving a general retrospect of the science in the past century, and its advancement as indicated in the theories and practices of distinguished members of the profession from 1778 to to-day.

In referring to the progress of dentistry during the past century, he stated that the father of modern dental surgery was John Hunter, F.R.S.,

whose history of the human teeth was published in 1778. Quotations were read from the publication, showing that Hunter, who, after giving his views of the causes and effects, proceeds to give the remedies for the cure, of the "decay of the teeth arising from rottenness;" and states that though the progress of the disease appears in some cases to be retarded by the removal of the part already decayed, yet there is but little dependence upon the practice. It would, however, prevent any effect which the rotten part might have upon the sounder parts. In many cases it would be impossible, because the decay had made too great progress, or had reached the "cavity" (pulp-chamber); in this latter case he would advise "that the tooth be extracted, and then immediately *boiled* to render it perfectly clean, as well as to destroy any life there might be in it, and then that it be restored to its socket; this will prevent any further decay of the tooth, as it is now dead, and not to be acted upon by any disease, and can only suffer chemically or mechanically." He also advocated using a hot iron and burning the ear to cure toothache. Quotations were also read from the writings of Jas. Fox, F.R.S., of 1806, who paid especial attention to the filling of teeth. He believed dental caries was incurable; also, that filling cavities was of doubtful utility, as the pressure of the food dislodges the stopping, making it necessary to often repeat the operation. However, Mr. Fox may have been as skillful as later operators would have been if confined to the use of the tools enumerated by him as an outfit for the dental practitioner of that day, viz.: "A hook for picking extraneous substances out of the cavity; a straight and a curved instrument for pushing the stopping into the tooth, and an instrument with a bulbous point, to be used as a burnisher." During the first twenty-five years in the history of dentistry progress was slow. In the earlier days the operating-room was a curious and mysterious place, and exclusiveness was everywhere prevalent among practitioners, each of whom had his own methods, which he regarded as superior to those of any other; but afterwards publications began to spring up, societies were formed, and such men as Harris, Townsend and Parmly, who delighted in spreading knowledge, engaged in this profession, etc. In the year 1829 the Baltimore College of Dental Surgery first commenced its labors, the first dental school in this or any country, and this may be said to have been the beginning of progress in the profession. In 1862 the mallet and pluggers were introduced, and the dentist could then restore the crown of a tooth. In 1865 the rubber dam was introduced by Dr. S. C. Barnum, and it was then thought that the pinnacle of

dental surgery had been reached. In the year 1870 the dental engine came into use, and with it a lessening of the pain in trimming, filing and excavating cavities, but in the hands of an inexperienced surgeon it is apt to produce cutting of the cheeks, etc., and it might prove more dangerous than useful.

The report then referred to the causes by which many dentists were constantly idle, while others are almost always busy, and showing that a skillful dentist, one who knows how to use his instruments, cannot but meet with success.

In concluding, Dr. Abbott referred to the fact that as practitioners of a specialty of a great and wonderfully useful profession, the necessity for a more positive prophylactic treatment of the organs of the mouth is becoming more and more apparent. In his own practice he always recommended to his patients something to prevent the teeth from decaying. In cases where the teeth decay rapidly, either from the lack of good organization or the action of mineral acids taken in medicines, he recommended rinsing by an alkaline solution; or in other cases merely more thorough cleansing. A solution he has found of very considerable utility is as follows:

Take—Sodæ bicarb., ℥ij;
Spirit. gaultheriæ,
Spirit. menth. pip.,
Tinct. anisi, each ℥ss;
Tinct. cocci, q. s.;
Aquæ, q. .s. Oj.—M.

At the conclusion of the reading of the paper, a cable dispatch was read from the American Dental Society of Europe, Grand Hotel, Paris, extending a fraternal greeting to the American Dental Association, and, on motion, the President and Secretary were instructed to send a suitable reply.

Dr. A. W. Harlan, of Chicago, presented a supplemental report on Operative Dentistry. He mentioned the researches of Drs. Bogue, Hitchcock and Chase concerning the use of amalgam, but did not think that it had been shown that it was the best of even the cheap fillings known, and also treated the subject of cohesive and non-cohesive gold. The report, in closing, said: "Now, whilst I am willing to accord to those great intellects of the past great honor for what they did in their day and generation, for the upbuilding of the science of operative dentistry, I am not willing to accept the heritage left us and use it in modern dental practice, for the reason that something more is

demand of us. As was remarked before, the teeth of the present generation are far inferior in structure to those operated on in the past. This fact alone makes it imperatively necessary that we, in our operations, should as thoroughly as possible protect all surfaces of dentine and enamel where the nature of the decay demands it, and this we are unable to accomplish with non-cohesive gold. Again, I contend that in the successful use of cohesive gold the development of the highest grade of skill is attained, the nature of that form of gold itself compelling the operation to proceed step by step, until every part of the filling is completed; thus, instead of being a hindrance, it is a positive benefit, as it enables the operator to put to the best possible use whatever of artistic ability he may possess. That the result attained is far superior to that of any other is unquestionably true; for, be it remembered, in the one case we have a perfectly coherent mass, and in the other the particles are only in apposition, and it matters not how well they were placed in position, no dependence can be placed on the strength of the filling itself, but, on the contrary, the walls and margins have to sustain all of the various requirements of mastication. We go a little further, and say that it is folly to suppose that we must make all of our fillings thoroughly dense, for that is not needed in all cases; but that it is more desirable for us to make them from a form of gold which possesses the element of cohesiveness, I am fully convinced."

MEETING OF THE FIRST DISTRICT DENTAL SOCIETY.

HELD AT THE RESIDENCE OF DRs. J. ALLEN & SON, No. 7 WEST 33D STREET, NEW YORK, TUESDAY EVENING, OCTOBER 3D, 1876.

The meeting being called to order by the President, Dr. J. S. Latimer, the minutes of the last meeting were read by the Secretary and approved.

Dr. Atkinson, of the Clinic Committee, reported that they had a very successful clinic that day, for the beginning of the winter campaign. Of the four operators expected, three were present.

Dr. Palmer, he said, gave a delineation of his classification of cavities, and the way to do it, and the way not to do it, in preparing cavities for filling, which was very highly spoken of by the best judges, and commended very highly. Those who have not had an opportunity of

seeing it, I would advise them to call on the Doctor and get the classification. I hope we shall soon see it in print, so that we can all have it at our pleasure.

The other cases were surgical cases, the most interesting and beautiful of which was that of a young lady from Canada. The attempt was made to remove the tumor before the extraction of the teeth, by galvanocautery. There seemed to be an abnormal growth of the arteries, or else an abnormal enlargement of the artery, that bled very freely, and retarded the progress of the operation, and rendered it so difficult to do that the operation was not completed, and the root of the second bicuspid still remains in the mouth. As to the principles of procedure, I heard many criticisms by men competent and incompetent to criticise.

In reference to incidents of office practice, Dr. Atkinson said he had two teeth in his possession, one of which looked as if it had a hole drilled through it. He proposed to cut it, to see whether it had a branch of pulp in it or not, or whether it was by some solution that it occurred. This shows how very important our associations are to bring these things out, as many things that are really common in our experience do not get into the books and are not recorded, and therefore are looked upon as quite rare.

Dr. Bronson said: I had occasion this summer to move the lateral incisor. The method I pursued was to use a narrow strip extending across the central incisor. The strip was applied about the first week in July, and the tooth was brought forward in about ten days. Wishing to keep it forward, I cut off my strip, tying it to the first bicuspid and the central incisor. I succeeded in removing the pulp entirely, and have since that succeeded in filling a tooth with a very slight discoloration.

Dr. J. S. Latimer said: A cut was made by rubbing back and forth with the brush. The patient had used the brush a great deal, and used it with a sharp, coarse powder. The method I used for filling this tooth was to apply the rubber gum, and drill directly up the centre, cutting a groove up a little higher than the cavity. Then I took a wheel-shaped burr and carried that up till the shank of the burr came in the groove. The burr was a little larger than the groove. I made a slight depression on the lower side next the gum, and with that cavity I filled it. By having an assistant who was himself a dentist I succeeded in getting a respectable operation, using the rubber gum to hold it down in its place.

Dr. Atkinson: This specimen that you have seen passing around is

an evidence of the absorption of the root of the tooth. I have not examined it particularly, but I think it has the characteristics of absorption, and from the amount of lime that is deposited on the inner wall of it, I should be inclined to think that it was one of those cases of absorption that resulted from motion upon and swaying to and fro, interfering with the nutrition—first with the cement, and then with the dentine in the root. It has the marks of the brush upon it, but how much it is attributable to the brush, and how much to the rubbing process, I am not clear in my mind as to that fact. The reason that I made that remark is, that I have seen teeth that had just this kind of appearance where the brush could get at them, and that had just such an appearance—with the difference of being more directly cut square down at the corners—where the brush could not get at them, and that suggested to me that the denuding process might have gone on in this tooth just as it had in the other, but the continued effort to keep the tooth clean with a brush had cut the corners away. There is another habit, indenting, that we do not exactly understand. I have seen it in the incisors below, but I do not think I have ever seen it in the incisors above.

Dr. Bogue: It must have been seven, eight or nine years ago that our worthy President took me to task one night when vindicating a certain mode in and frequency of brushing, and I remember at that time I had a case where I felt perfectly convinced that the brush had done the grooving, and the reason for that conviction was the statement of the patient, and his wife, too, that ever since she had known him he had been in the habit of spending more time in brushing his teeth than he did in washing himself; that he brushed his teeth twice a day with prepared chalk. On examination I found the man was in the habit of brushing his teeth above and below with the utmost vigor, but on the insides of the teeth it was very little brushed. Dr. Atkinson described the actual condition of it perfectly, that absorption did take place from just that cause. The teeth had been loosened. They had been cleansed rapidly. The upper teeth, in this instance, are just as distinctly marked between the cuspids as the lower. There was no such mark discernible from the tooth-back on the bicuspid below, and but little above. I have evidence again as to the cause of this groove. I had a plaster cast taken two or three years ago, in order to show how far it had gone in front. I instructed him about brushing in a different way, and he in a measure complied, but I told him to quit that brushing straight across, and to give a rotary motion to the brush, which should succeed in brushing down on the upper teeth, and down on the

lower teeth, within and without. I told him to remember that the teeth had four sides, and they all wanted brushing equally; to simply brush them in front and use a powder would not benefit the backs.

Dr. Atkinson: There is a point behind these remarks that is of very much value, and that is, that the cells that constitute our bodies have a life line; that when they run out they cannot be reproduced. Now why the string motion produced that absorption was that it was rounded on both sides all the way, and not an absorption from one side, showing that it was being turned down by the reversed process of its having been filled up. Now, why did not the socket yield, and not the end of the tooth? Because the life line of the reproductive elements in the tooth have run out, and were weaker than the life line of the elements of the tissues of the socket.

Dr. Abbott: Speaking of the absorption of the teeth, I never have found a case of that kind that the brush has not done the work. I believe that it is the general opinion that that is the case. I have had two or three cases within the last year or two, where the teeth have died without any apparent cause whatever; the cusps were ground off, and the left lateral incisors one-third of them dead.

Dr. W. H. Allen: I have a patient that has been in the habit of using the brush very thoroughly upon the side teeth, molar and bicuspids, the teeth are yet sound, or nearly so, but the continued use of the brush has evidently caused absorption of the gums, so much so that nearly the entire length of the outer fangs is now uncovered, and I can see no reason, except the excessive use of the brush, why it should be so. My impression is that the continued excessive use of the brush has caused that absorption of the gum.

Dr. John Allen: I remember distinctly a gentleman who, from some financial trouble, became very much excited, and during that time nearly all of his teeth were affected in this peculiar way, and almost immediately after that—after this trouble ceased—nearly all the teeth loosened from the mouth. That was a very peculiar case that that should take place, and that in less than a year from that time all the teeth were loosened.

I saw a lady this morning, and I noticed that two of her teeth were loosened. She was a lady about forty or forty-five, and takes admirable care of her teeth. Dr. Abbot spoke of the dying of the teeth. They had this same peculiarity of which he spoke, and were first worn off. She had such intense pain that she visited me three or four times, and asked me to remove those teeth. She said she suffered so intensely

that something must be done with them, and when they were removed I found the same peculiarity that Dr. Abbott mentioned to-day, without signs of decay in the teeth. The pulps were not dead.

Dr. Abbott said he had a case about a year ago. He drilled through the tooth and cut it open, and into one of the canals running up; that produced pressure on one of the little nerves that run through there. The pulp was alive when I took it out.

Dr. ———, of California, said: A lady, one of my patients, had very good teeth. I examined her teeth very closely, and found the first bicuspid, and I think one of the lateral incisors on one side, very clean, and on the opposite side the gums were inflamed a good deal. I finally asked her if she was aware that she had forced her teeth a little to one side. She said yes, she was perfectly aware of it. I found she had used a brush, missing some of the back teeth, brushing very vigorously on one side and slightly on the other side.

Dr. C. Latimer said: I have a case. Some years since a lady lost her husband and was in sad trouble for a number of months, perhaps for a year, sickness in the family, etc., and during that time the teeth were worn very much, more, perhaps, than any other set I ever had under observation, and I felt very confident it was owing to her trouble and anxiety of mind, and, so far as I can judge of it by the cases I have seen of that kind, was attributable very largely to the action of acid, as well as the use of the brush. I have always recommended the use of a moderately soft brush. I believe that any brush that will irritate the margins of the gums will do mischief. I used in the case above referred to antacids, and lessened the amount of rubbing, using a very soft brush.

Dr. John Allen said: I have had one case recently of this nature. A gentleman whose eyes became very much affected, and who had consulted various physicians and opticians, the best that we have in the city. One of them remarked that he would give a thousand dollars to know what was the matter with his eyes. They looked perfectly well—no appearance of cataract, no appearance of disease, and yet the man became so blind that he could scarcely see to read, in fact, he could not read fine print, and yet he was not over 40 years of age. His eyes kept getting worse and worse. A white table-cloth hurt his eyes, and the sunlight was very painful to them. He came to me, and said he, “Do you recollect some ten years ago you told me that the time would come when I would have trouble with the aching tooth?” I had forgotten entirely. Said he, “you did, I am sure, and that tooth is trying to

make its way out now." I told him, however, what I thought, that it was probable that a branch of the nerve connected with the optic nerve, and the inflammation had been so produced as to cause the blindness, and I told him that he had better consult the physician that he usually consulted. He did so, and told him what I had said, that I believed the difficulty arose from that aching tooth, and finally had the tooth taken out. After a few weeks he began to get considerable better, and has been gradually getting better up to the time that I last saw him. I requested him to call from time to time, and let me know in what condition his eyes were. They were very much better when he last called; the sunlight did not hurt him, and he could see, and my impression is that that tooth caused his difficulty with the eyes.

Dr. Atkinson: There is one class of diseases that evidently come within the province of dentistry, and that is those that depend upon reflex nervous action, and this case that is noticed by Dr. Allen is an eminent example of that class. Dental literature is full of cases of that kind. If you recollect, a Professor reported a case of amaurosis resultant upon the irritation arising from a splinter of wood that had been used as a tooth-pick in a hollow tooth, and he broke it off in there. These cases, I believe, are capable of being classified under the head of those originating in reflex nervous action.

Adjourned.

Subject for next Meeting—"Diseases of the Dental Pulp, their Sequence and Treatment."

NEW PLATE RETAINER.

By W. S. ELLIOTT, D.D.S., M.D.S., GOSHEN, N. Y.

In cases where it has proved difficult to retain a set of artificial teeth in the mouth, owing to extreme absorption of the alveolar processes, or where it is impracticable or undesirable to use clasps, a plan is herein suggested which has proved, in a limited number of instances in which it has been used, eminently successful. It is simply to construct the central portion of the plate of flexible instead of hard rubber. That is to say, all that portion of the plate where the air chamber is usually placed is made flexible, that it may readily hug the natural tissues sufficiently close to prevent displacement in mastication. The method of construction adopted by the writer is as follows:

Make the try-plate of tea-lead covered with gutta-percha. After the proper adjustment of the teeth wax up in the usual way, then remove the plate from the model, and with a sharp knife cut away all the gutta-percha and lead from the palatine portion, and as close to the teeth as possible without endangering the strength of the arch. Set the teeth aside. Now take a smooth and fair sheet of English palate rubber and fold it once upon itself to gain sufficient thickness; from this folded sheet cut a piece the shape of and a little larger than an ordinary air chamber. Warm the model and lay this piece directly upon the palatine surface, pressing it well down, in order that the rugae may be as perfectly copied as possible. Should there be any difficulty in retaining it *in situ*, a stiff solution of gum arabic may be used to assist. Next cut from a sheet of hard rubber a strip about $\frac{3}{16}$ inch wide, and after warming lay it carefully around the outside of the flexible rubber, already on the model in such a manner that the two will become united in one piece. Cover the whole with heavy tin foil trimmed to the size of the rubber. After which pour plaster over the tin foil, allowing it to spread out over the tin, and round up in the middle $\frac{1}{4}$ to $\frac{1}{2}$ inch. After the plaster has set, return the teeth to the model and restore the wax wherever it is deficient, letting it join the exposed edge of the rubber. The case is now ready for flasking, and in doing this allow the fluid plaster to flow over the posterior edge of the case and encroach upon the hard plaster which covers the rubber. Prior to adjusting the upper section of the flask, brush over the plaster a coating of "parting fluid," which will ensure a clean and beautiful separation. After opening the flask, remove the wax and proceed to pack in the usual manner. The palate rubber vulcanizes in the same time and at the same degree of heat as the hard rubber.

If each step has been carefully taken, and just the right quantity of material used, the line of union between the hard and flexible rubber will be regularly defined, and it will require no finishing other than the felt wheel and powders.

AUDIBLE SPEECH BY TELEGRAPH.

PROF. A. GRAHAM BELL'S DISCOVERY—SUCCESSFUL AND INTERESTING EXPERIMENTS BETWEEN BOSTON AND CAMBRIDGEPORT.

The following account of an experiment made on the evening of October 9 by Alexander Graham Bell and Thomas A. Watson is inter-

esting, as being the record of the first conversation ever carried on by word of mouth over a telegraph wire. Telephones were placed at either end of a telegraph line owned by the Walworth Manufacturing Company, extending from their office in Boston to their factory in Cambridgeport, a distance of about two miles. The company's battery, consisting of nine Daniels cells, was removed from the circuit and another of ten carbon elements substituted. Articulate conversation then took place through the wire. The sounds, at first faint and indistinct, became suddenly quite loud and intelligible. Mr. Bell in Boston and Mr. Watson in Cambridge then took notes of what was said and heard, and the comparison of the two records is most interesting, as showing the accuracy of the electrical transmission :

BOSTON RECORD.

Mr. Bell—What do you think was the matter with the instruments?

Mr. Watson—There was nothing the matter with them.

B.—I think we were both speaking at the same time.

W.—Can you understand anything I say?

B.—Yes; I understand everything you say.

W.—The reason why you did not hear at first, was because there was a relay in the circuit.

B.—You may be right, but I found the magnet of my telephone touching the membrane.

W.—I cut this relay out and then the sounds came perfectly.

B.—I hear every syllable. Try something in an ordinary conversational voice.

W.—Shall I connect their battery in the circuit?

B.—No; there is no necessity to connect their battery in the circuit,

CAMBRIDGEPORT RECORD.

Mr. Bell.—What do you think is the matter with the instruments?

Mr. Watson—There is nothing the matter with them.

B.—I think...at the same time.

W.—Can you understand anything I say?

B.—Yes; I understand everything you say.

W.—The reason why it did not work at first was because there was a relay in the circuit.

B.—You may be right, but I find that my touches the membrane.

W.—I cut the relay out, and then the sounds came out perfectly.

B.—I hear every syllable. Try something in a conversational voice.

W.—Shall I connect their battery in the circuit?

B.—No; here is no necessity for putting their battery in the cir-

for the sounds come out quite loudly.

W.—I am now talking in quite a low tone of voice.

B.—The sounds are quite as loud as before, and twice as distinct.

W.—Cut out the battery and then talk.

B.—All right. I will cut out the battery now if you will keep listening.

[Here an interruption occurred, and after a short time Mr. Bell said:]

B.—I thought you were going to say something.

W.—Is the battery cut out?

B.—No, but I will do it now.

[Battery having been cut out, Mr. Bell continued.]

B.—Do you hear anything now?

[Battery replaced.]

B.—Did you hear anything?

W.—No, not a sound.

B.—Say something to me when I cut out the battery again.

[Battery cut out.]

W.—.....

.....
.....

W.—I could not hear a sound when the battery was cut out.

[Battery replaced.]

B.—I fancy I heard a trace of your voice.

W.—Shall I put on our battery to see if it increases the effect?

B.—I'll tell you what we'll do. We'll take off our battery and put on theirs, as before.

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W.—I am now talking in quite a low tone of voice.

B.—The sounds are quite as loud as before, and quite as distinct.

W.—Cut out the battery and then talk.

B.—All right. I will cut out the battery now if you will keep listening.

B.—I thought you were going to say something

W.—Is the battery cut out?

B.—No, but I will do it now.

B.—Did you hear anything?

W.—No, not a sound.

B.—Say something to me when I cut out the battery again.

B.—I fancied I heard a trace of your voice.

W.—Shall I put on their battery to see if it increases the effect?

B.—I'll tell you what we'll do. We'll take off our battery altogether and put on theirs, as before.

[The company's battery having been placed in circuit, faint and indistinct sounds were heard at the Boston end, and then came the intelligible sentence.]

W.—Is our battery off?

W.—Is our battery off?

B.—Yes, our battery is off. What have you been doing? The sounds were quite soft at first, but now they are quite loud.

B.—[Very indistinct—unintelligible.]

B.—Shall I put on our battery again?

W.—[Indistinctly heard.] That was very indistinct. Put on our battery.

W.—That was very indistinct. Put on our battery.

[Original battery replaced.]

B.—We may congratulate ourselves upon a great success.

B.—We may congratulate ourselves on our great success.

W.—Both batteries are on now. [Another sentence heard indistinctly.]

W.—We deserve success. Both batteries are on now.

B.—Repeat the last sentence.

B.—Repeat the last sentence.

W.—Both batteries are on now.

W.—Both batteries are on now.

B.—I understood that before, but I thought you said something else.

B.—I understood that before, but I thought you said something else.

W.—Remove their battery, please.

W.—Reverse your battery, please.

B.—All right, our battery is the only one on now.

B.—All right; our battery is the only one on now.

W.—I have put battery cells on here.

W.—I have six Daniels cells on here.

B.—How many cells have you there?

B.—How many cells have you on there?

W.—S—i—x—six.

W.—S—i—x—six.

B.—Please whisper something to me.

B.—Please whisper something to me.

W.—[Sound of the whisper clearly audible, but the utterance unintelligible.]

W.—I am now whispering.

B.—I could hear you whispering, but could not understand what you said.

B.—I could hear you whispering, but could not understand what you said.

W.—Perhaps we have got the batteries opposed to one another. Had you not better reverse your battery and see what the matter is— or rather what the effect is?

B.—I will try the effect of reversing my battery.

W.—Perhaps we have got the batteries opposed to one another. Had you not better reverse yours, and see what the effect is?

B.—I will try the effect of reversing my battery.

[Battery reversed.]

B.—Is this any better?

B.—Is this any better?

W.—That sentence was accompanied by that curious crackling sound.

W.—Much fainter, accompanied by that curious bubbling sound.

B.—Yes, I hear it too.

....

B.—What time is it by your watch?

....

....

[Battery again reversed.]

W.—What are you doing? I have not heard anything except... for quite a while.

W.—What are you doing? I haven't heard anything except that bubbling sound for quite a while.

B.—I asked you what time it was by your watch. Perhaps you hear me better now, because I have reversed the battery again.

B.—I asked you....

....

....

....because I....

....

W.—My battery is now cut out.

W.—My battery is now cut out.

B.—Don't you think we better go home now?

B.—Do you think we had better go home?

W.—Yes, but why does your talking come out so much fainter now?

W.—Yes, but why does your talking come out so much fainter now?

[Mr. Bell here placed the magnet of the telephone nearer to the membrane.]

B.—Because I had moved the magnet further away from the membrane.

B.—Because I moved the magnet further away from the membrane.

W.—That was very much more distinct.

W.—That was very much more distinct.

B.—Will you try to understand a long sentence if I speak right on?

W.—I will.

B.—A few minutes ago I heard a fire-engine pass by the door. I don't know where the fire is, but the number of the box is 196.

W.—The time by my watch is five minutes past ten. Had I not better go into Boston?

B.—Yes; I think it is time to stop now.

W.—Shall I go to Exeter place?

B.—Yes; but look in here on your way in case I have not gone.

W.—Let us talk conversationally without noting.

Conversation was then carried on for about half an hour with the utmost freedom, and the experiment closed.

B.—Will you try to understand a longer question if I speak right on?

W.—I will.

B.—A few minutes ago I heard a fire-engine go past the door. I don't know where the fire is, but the number of the box is 196.

W.—The time by my watch is five minutes past ten. Had I better not go into Boston?

B.—Yes; I think it is time to stop now.

W.—Shall I go to Exeter place?

B.—Yes; but look in here on your way in case I have not gone.

W.—Let us talk conversationally without noting.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

REGULATIONS RESPECTING THE EDUCATION AND EXAMINATION OF CANDIDATES FOR THE DIPLOMA OF MEMBER OF THIS COLLEGE.

SECTION I.

Preliminary General Education and Examination.

1. Candidates who commenced their Professional Education on or after the 1st of January, 1861, will be required to produce one or other of the following Certificates:

1. Of Graduation in Arts at a University recognized for this purpose.

The following are the Universities at present recognized, viz.:

Oxford, Cambridge, Dublin, London, Durham, Queen's University in Ireland, Edinburgh, Glasgow, Aberdeen, and St. Andrew's.

Calcutta, Madras, and Bombay.

Canada: McGill College, Montreal; and Queen's College, Kingston.

2. Of having passed an Examination for Matriculation or such other Examination as shall, in either case, from time to time be sanctioned

by the Council of this College, at a University in the United Kingdom, or at a Colonial or Foreign University recognized by the Council of this College.

The following are the Examinations at present recognized under this Clause (No. 2), viz. :

Oxford.—Responsions or Moderations.

Local Examinations, Senior and Junior. The Certificates to include Latin and Mathematics.

Cambridge.—Previous Examination.

Local Examinations, Senior and Junior. The Certificates to include Latin and Mathematics.

Oxford and Cambridge.—“Schools’ Examination Board.” The Certificates to include the several subjects required in the Preliminary Examination of the College.

Dublin.—Entrance Examination.

London.—Matriculation Examination.

Durham.—Examination of Students in Arts in their second and first years.

Local Examinations, Senior and Junior. The Certificates to include Latin and Mathematics.

Registration Examination for Medical Students.

Queen’s University in Ireland.—Two years’ Art Course for Diploma of Licentiate in Arts.

Preliminary Examinations at end of B. A. Course.

Local Examinations. The Certificates to include Latin and Mathematics.

Matriculation Examinations.

Edinburgh, Aberdeen, Glasgow, and St. Andrew’s.—Preliminary or Extra Professional Examinations for Graduation in Medicine.

Calcutta, Madras, and Bombay.—Matriculation Examinations.

Canada: Queen’s College, Kingston.—Matriculation Examination, Preliminary Examination of Students in Medicine. McGill College, Montreal; Bishop’s College, Montreal; University College, Toronto; University of Trinity College, Toronto; Victoria College, Toronto; University of Laval, Quebec.—Matriculation Examinations.

Nova Scotia: King’s College, Windsor.—Matriculation Examination.—Responsions. New Brunswick: Fredericton.—Matriculation Examination. Dalhousie College and University, Halifax.—Matriculation Examination.

Australia: Melbourne.—Matriculation Examination, with a Certificate that the Student has passed an Examination in Latin. Sydney: Matriculation Examination. Adelaide: South Australian Institute. University of the Cape of Good Hope.—Matriculation Examination. New York: Bellevue Hospital Medical College.—Matriculation Examination.

3. Of having passed the Preliminary Examination for the Fellowship of this College.

4. Of having passed the Preliminary Examinations of the Royal College of Surgeons in Ireland and of Edinburgh, or of the Faculty of Physicians and Surgeons of Glasgow.

5. Of having passed the Examinations in Arts of the Society of Apothecaries of London, or of the Apothecaries' Hall of Ireland.

6. Of having passed the First-Class Examination of the College of Preceptors.

7. Of having obtained the Testamur of the Codrington College, Barbadoes.

8. Of having obtained the Degree of Associate of Arts granted by the Tasmanian Council of Education, with a Certificate that the Student has been examined in Latin and Mathematics.

9. Of having passed the Voluntary Examinations of Christ's College, Canterbury, New Zealand, the Certificate to include all the subjects required from time to time in the Preliminary Examination of the College.

II. Candidates who shall not be able to produce one or other of the foregoing Certificates will be required to pass an Examination in English, Classics, and Mathematics, conducted by the Board of Examiners of the College of Preceptors, under the direction and supervision of the College.

This Examination is at present compulsory only on Candidates for the Membership or Fellowship of the Royal College of Surgeons, but all Candidates for the Dental Diploma are earnestly advised to pass it, as, on and after the 1st of October, 1877, this Preliminary Examination will be compulsory on all Candidates for the Dental Diploma.

The following are the subjects of the Examination referred to in the foregoing paragraph for the year 1876, and until further notice, viz. :

PART I.—COMPULSORY SUBJECTS.

1. Writing from dictation.
2. English Grammar.

3. Writing a short English composition; such as a description of a place, an account of some useful or natural product, or the like.

4. Arithmetic. No Candidate will be passed who does not show a competent knowledge of the first four rules, simple and compound, of Vulgar Fractions, and of Decimals.

5. Questions on the Geography of Europe, and particularly of the British Isles.

6. Questions on the outlines of English History, that is, the succession of the Sovereigns and the leading events of each reign.

7. Mathematics. Euclid, Books I and II, or the subjects thereof; Algebra, to Simple Equations inclusive.

8. Translation of a passage from the second book of Cæsar's Commentaries, "De Bello Gallico.

PART II.—OPTIONAL SUBJECTS.

Papers will also be set on the following six subjects, and each Candidate will be required to offer himself for examination on one subject at least, at his option; but no Candidate will be allowed to offer himself for examination on more than four subjects:

1. Translation of a passage from the first book of the Anabasis of Xenophon.

2. Translation of a passage from X. B. Saintine's "Picciola."

3. Translation of a passage from Schiller's "Wilhelm Tell."

Besides these Translations into English, the Candidate will be required to answer questions on the Grammar of each subject, whether compulsory or optional.

4. Mechanics. The questions will be chiefly of an elementary character.

5. Chemistry. The questions will be on the elementary facts of Chemistry.

6. Botany and Zoology. The questions will be on the classification of Plants and Animals.

The quality of the handwriting and the spelling will be taken into account.

N. B.—Each Candidate (who has not at a previous Examination paid the amount) is required to pay a fee of £2 on the morning of the first day of the Examination prior to his admission thereto. Particulars respecting the date of the Examination will be duly advertised in the journals. Candidates are required to send in the prescribed form of application not less than three weeks before the commencement of the Examination.

NOTE.—A Candidate, in order to qualify for the Fellowship, is required, in addition to the subjects included in Part I, to pass in Greek, and in French or German, and in one, at his option, of the remaining subjects in Part II.

We subjoin, with permission, examples of some of the questions on each subject, as they were given at the last Examination, but copies of the complete examination papers may be had of C. F. Hodgson & Sons, 1 Gough Square, Fleet Street, E.C. Price, 6d. the set, or by return of post on enclosure of seven postage stamps.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—PRELIMINARY GENERAL EXAMINATION, MARCH, 1876.

English Grammar and Composition.

It is said that, while the English alphabet has not enough symbols, it has also some useless ones. Explain and illustrate this statement.

Define an adjective. Give instances of different kinds of adjectives, and show how adjectives may be formed from nouns. Write down the positive of *last*, *best*, *first*, *furthest*, *least*, *utmost*, *worst*.

Show that words ending in *-ing* may be either *participles* or *nouns*.

How are adverbs classified? Form adverbs from the following words: *who*, *the*, *head*, *good*, *first*, *back*, *piece*.

Analyze the following passage, and parse fully the words in italics:

At last, when care had banished sleep,
He saw *one morning*—dreaming—doting,
An empty hogshead from the deep
Come shoreward floating.

Geography.

[N. B.—Not more than *eight* questions need be answered.]

Mention the chief mountain and hill ranges in Scotland, and state in what direction they run. Name the highest summit in the British Islands.

Mention six inland watering-places in England, and state the counties in which they are situated.

What English counties lie south of the Thames? Give the county town in each case.

What and where are the following places: Bosphorus, Cattegat, Dardanelles, the Hague, Nordkyn, the Skaw, the Sound, Zuyder Zee?

How is Switzerland separated from Italy, France, Germany and Austria respectively? What is the form of government in Switzerland?

Arithmetic.

Multiply 5 oz. 7 drs. 2 scr. 15 grs. by 35; and divide £29 11s. 4½d. by 83.

Find the difference between the average length of a month in the first and second halves of the year 1876.

Express $\frac{13}{1000}$, $\frac{3}{8}$, $\frac{41}{110}$ as decimals; and .07625 as a fraction in its lowest terms.

What part of £6 1s. 1¾d. is five-sixths of £3 12s. 8¼d.?

Express 758 millimetres in inches.

English History.

What traces still exist of the occupation of England by the Romans and Saxons?

Write an outline of the reign of John.

Assign dates to the accession of the following sovereigns: Stephen, Edward III, Henry IV, James I, William and Mary, Victoria; and state, in each case, on what grounds the crown was claimed.

What were the chief incidents in the constitutional struggle between the Sovereign and the People under the Stuart Kings?

Latin.

I. TRANSLATE INTO ENGLISH:

Gallorum eadem atque Belgarum oppugnatio est haec. Ubi circumjecta multitudine hominum totis moenibus undique in murum lapides jaci coepti sunt, murusque defensoribus nudatus est, testudine facta, portas succedunt murumque subruunt. Quod tum facile fiebat. Nam quum tanta multitudo lapides ac tela conjicerent, in muro consistendi potestas erat nulli. Quum finem oppugnandi nox fecisset, Iccius Remus, summa nobilitate et gratia inter suos, qui tum oppido praefuerat, unus ex iis, qui legati de pace ad Caesarem venerant, nuntium ad eum mittit.

II. GRAMMATICAL QUESTIONS.

The case and construction of *multitudine*, *moenibus*, *defensoribus*, *portas*, *nulli*, *nobilitate*, *oppido*, *legati*.

The present, perfect, supine and infinitive (active) of *jaci*, *succedunt*, *conjicerent*, *mittit*; also of *ago*, *jaceo*, *gero*, *emo*.

What was the *testudo* used in sieges, and why so called?

What are *deponent* and *neuter-passive* verbs? Give examples.

Euclid—Books I and II.

Define the terms *plane surface*, *right angle*, *figure*, *acute-angled triangle*, *rectangle*.

To draw a straight line perpendicular to a given straight line of unlimited length, from a given point without it.

If a four-sided figure be a parallelogram, then the diameter bisects the four-sided figure, *that is*, divides it into two equal parts.

State the *converse* of this proposition. Is the converse generally true?

Prove that any line, *AD*, drawn from the vertex, *A*, of the isosceles triangle, *ABC*, and meeting the base, *BC*, in *D*, is less than a side, *AB*.

To describe a square that shall be equal to a given rectilineal figure.

French.

I. TRANSLATE INTO ENGLISH:

“A boire !” dit le malade.

Au son de cette voix qu’il croyait ne devoir plus entendre, Ludovic ouvre de grands yeux et regarde avec stupéfaction Charney, dont la figure lui apparaît sous une nappe de sueur. Ses membres ruissellent, un nuage de vapeur sort de ses draps et de ses couvertures humides. Soit qu’une crise salutaire se fût déclarée tout à coup, et que, la nature aidant, le tempérament vigoureux du prisonnier triomphât du mal, soit que la double dose du liquide à lui administrée par Ludovic fût douée d’une grande puissance sudorifique, cette forte transpiration semble avoir à la fois rendu le malade à la vie et à la raison. Il ordonne lui-même ce qu’il lui paraît convenable de faire pour son soulagement. Puis, se tournant vers le prêtre, qui se tenait humble au chevet de son lit: “Je ne suis point mort encore, Monsieur,” lui dit-il, “vous le voyez.” . . . —SAINTINE, “Picciola.”

II. QUESTIONS ON GRAMMAR.

Write the first person singular of the *present indicative* and the *past indefinite* of the verbs *boire*, *croyait*, *devoir*, *entendre*, *sort*, *faire*, *se tenait*, *dit*, *voyez*, *paraît*.

How do you render *whose* interrogative, as in “*Whose voice did I hear? Whose house is this?*” How else do you express *whose* when used as a conjunctive pronoun?

Translate into French: He is tired. He is sleepy. He is asleep. His head aches. Open your eyes. Go to bed. This room is not yours, it is mine. Come this way. Which shall I give him, tea or brandy? Give him neither.

Algebra.

Find the value of $\frac{3x-a}{3x+a} + \frac{3x+a}{3x-a} - \frac{4}{35}$ when $x=4$, $a=2$.

Divide $x^4 + x^3 - 4x^2 + 5x - 3$ by $x^2 + 2x - 3$.

Solve the equations—

$$(a.) \ 4x + \frac{x+2}{3} = 5x-2.$$

$$(b.) \ \frac{3}{x} + \frac{4}{x} = \frac{5}{x} - \frac{x-2}{\frac{1}{2}x} - 2.$$

$$(c.) \ \frac{x}{2} + \frac{x-4}{5} = \frac{x+8}{3} - 2.$$

Find the Least Common Multiple of

$$x^2 + 10x + 16 \text{ and } x^2 - 7x - 18.$$

A. starts from York for London, a distance of 200 miles, at 15 miles an hour; four hours after, B. leaves London for York, traveling 16 miles an hour; where will they meet?

Greek.

I. TRANSLATE INTO ENGLISH:

Ταῦτα εἶπεν· οἱ δὲ στρατιῶται, οἳ τε αὐτοῦ ἐκείνου καὶ οἱ ἄλλοι, ταῦτα ἀκούσαντες, ὅτι οὐ φαίη παρὰ βασιλέα πορεύεσθαι, ἐπήνεσαν· παρὰ δὲ Ξενίον καὶ Πασίωνος πλείους ἢ δισχίλιοι λαβόντες τὰ ὄπλα καὶ τὰ σλενοφόρα ἑστρατοπεδεύσαντο παρὰ Κλεάρχῳ. Κῦρος δὲ τούτοις ἀπορῶν τε καὶ λυπύμενος μετεπέμπετο τὸν Κλεάρχον· ὃ δὲ ἵεναι μὲν οὐκ ᾔθελε, λάθρα δὲ τῶν στρατιωτῶν πέμπων αὐτῷ ἄγγελον ἔλεγε θάρρειν, ὥς καταστησομένων τούτων εἰς τὸ δεῖν· μεταπέμπεσθαι δ' ἐκέλευεν αὐτόν· αὐτὸς δ' οὐκ ἔφη ἵεναι. Μετὰ δὲ ταῦτα συναγαγὼν τοὺς θ' αὐτοῦ στρατιώτας καὶ τοὺς προσελθόντας αὐτῷ καὶ τῶν ἄλλων τὸν βουλόμενον ἔλεξε τοιάδε.

II. GRAMMATICAL QUESTIONS.

Decline throughout the singular *στρατιῶται*, *λαβόντες*, *αὐτῷ*; and throughout the plural *βασιλέα*, *πλείους*, *συναγαγών*.

The future, perfect, and aorist of *ἀκούσαντες*, *ἐπήνεσαν*, *ἔλεγε*, *ἐκέλευεν*, *προσελθόντας*.

Parse *ἀπορῶν*, *λάθρα*, *καταστησομένων*.

Chemistry.

How can it be proved that water consists of oxygen and hydrogen, and of nothing else; and how are the proportions, by weight and by volume, ascertained?

Describe, without using formulæ, the processes of preparing phosphorus; and mention its properties and allotropic modifications.

Write down what you know of the chemistry of bromine and its compounds.

After the corresponding number in each case, write down the chemical name of the substance of which each of the following materials essentially consists:

- | | | |
|-------------------|----------------------|------------------|
| 1. Saltpetre. | 6. Bleaching powder. | 11. Epsom salts. |
| 2. Vitriol. | 7. Black lead. | 12. Vinegar. |
| 3. Alum. | 8. White lead. | 13. Clay. |
| 4. Vermilion. | 9. Sand. | 14. Calomel. |
| 5. Prussian blue. | 10. Glass. | 15. Chalk. |

German.

I. TRANSLATE INTO ENGLISH.

GEZLER.

Deffnet die Gasse—Frisch, was zauderst du?
 Dein Leben ist verwirkt, ich kann dich tödten;
 Und sieh, ich lege gnädig dein Geschick
 In deine eigne kunstgeübte Hand.
 Der kann nicht klagen über harten Spruch,
 Den man zum Meister seines Schickfals Macht.
 Du rühmst dich deines sichern Blicks. Wohlan!
 Hier gilt es, Schütze, deine Kunst zu zeigen;
 Das Schwarze treffen in der Scheibe, das
 Kann auch ein Andrer; der ist mir der Meister,
 Der seiner Kunst gewisz ist überall,
 Dem's Herz nicht in die Hand tritt, noch in's Auge.

WALTER FÜRST (WIRST SICH VOR IHM NIEDER).

Herr Landvogt, wir erkennen eure Hobeit;
 Doch lasset Gnad' für Recht ergeben, nehmt
 Die Hälfte meiner Habe, nehmt sie ganz!
 Nur dieses Grätzliche erlasset einem Bater!

(*Schiller.*—"WILLIAM TELL.")

II. GRAMMATICAL QUESTIONS.

Indicate the gender and the nominative plural of Gasse, Geschick, Hand, Spruch, Meister, Schicksal, Schutze, Kunst, Herz, and Auge.

Does der Hase follow the weak or the strong declension; and masculines of what description are declined like Hase?

Give the present indicative of treten, and the second person singular of the same verb.

Mechanics.

[N. B.—No credit will be given for answers which merely give numerical results without indicating the reasoning employed to arrive at them.]

A weight of thirty pounds is supported by two strings which are at right angles to each other, and one of them makes one-third of a right angle with the vertical; find the tension in each string (i) by drawing a figure,* (ii) by calculation.

One end of a string is fastened to a fixed peg, and a weight, not much less than the greatest that the string can bear, is hung to the other

* If you have not the means of drawing an accurate figure, draw the best you can, and explain how you would make use of a better figure so as to solve the problem proposed.

end. Explain how it is that (although the string could support the weight, if hanging at rest, for any length of time) it can be broken by raising the weight, so that the string becomes slack, and then letting the weight drop, so as to stretch the string suddenly. Also show what would be the effect (if any) of fastening the upper end of the string to a spring, instead of to a fixed peg.

A stone is dropped from the edge of a cliff 400 feet high: with what velocity will it strike the ground at the bottom? At what height above the ground will it have a velocity of 112 feet per second?

Natural History.

I. BOTANY.

Define the terms *nut*, *berry*, *capsule*, *strobilus* and *siliqua*. Mention one or more examples of each.

Describe the structure of a *bean* and a grain of *wheat* respectively, and the changes which take place during their germination.

Arrange in their natural orders, with Latin names if possible, the following plants: *Adder's tongue*, *bamboo*, *loosestrife*, *poppy*, *bullrush*, *crowfoot*, *lily*, *water-lily*, *gentian*, *parsnip*, *furze*, *mustard*.

II. ZOOLOGY.

What are the great distinctive characters separating the *vertebrata* from the *invertebrata*, and the latter from *plants*?

What features and peculiarities of structure distinguish the *sharks* and *rays* from other fishes? In what group or division are they classified?

Group the following animals in their classes and orders, with their Latin names, if possible: *Alpaca*, *alligator*, *cobra*, *cockroach*, *dove*, *duck-mole*, *earwig*, *falcon*, *heron*, *hydra*, *leech*, *pike*, *seal*, *sturgeon*, *shrew*.

[We reproduced this article from the *British Journal of Dental Science*, because it seemed to us that the profession, young and old, could not fail to find interest in an examination of the requirements demanded of those who would prepare themselves for a learned profession in England. By the side of such a searching examination, the requirements of our schools do not seem worthy of mention.

It will be seen that while the examination in English, Classics and Mathematics is not compulsory on candidates for a Dental Diploma before Oct., 1877, it is now earnestly advised.—ED.]

TREATMENT OF THE DENTAL PULP.

By LANE CLARK, L.D.S., R.C.S.

The methods of treating the dental pulp under its various conditions of disease are many and varied, and though each of its kind has a certain success, yet withal failures are in certain cases frequent, and we are again compelled to "try fresh fields and pastures new." Knowing this, I venture to add my mite to the troubled science. It has for some

time appeared to me a strange way of restoring so delicate an organism as the pulp to health by treating it with such gentle means as strong nitric acid, arsenic and a few more remedies running from one extreme to the other. My failures have been so frequent in all that I have tried that I was induced to seek for a body which would place the pulp under the same conditions as those in which it lived and flourished; in fact, to try and replace the lost dentine. I have found such means in gelatinized phospho-carbonate of lime, which is capable of being rendered very plastic for a short time and hardening very quickly. In pulps which have been exposed for some time I have found it requisite to mix with the compound a little tannic acid, but even in those cases I finish at one visit. I take care to saturate the cavity at starting with glycerine, so that the air may be kept from the pulp while freely exposing it; after thoroughly removing all the decomposed parts, I place the gelatinized lime over the pulp, and using pressure until a slight sense of pain is felt, I accelerate the hardening of the lime with absolute alcohol. So soon as it is hard, I then treat as an ordinary case and plug at once. My success has been so constant with it that I have now lost all my former fears of failure in conservative treatment of the dental pulp. It may be that the means employed are not new, but whether it be so or not, it has proved in my practice a means of saving many a tooth otherwise condemned by the forceps.—*Monthly Review of Dental Surgery.*

NOTES.

The Licentiate—Frontispiece.

Our frontispiece speaks for itself, and is a reproduction from a fine engraving lent us for the purpose by Dr. J. T. Codman, of Boston, Mass.—[ED.]

Connecticut Valley Dental Society.

At the annual meeting of the "Connecticut Valley Dental Society," held in Springfield, Mass., Oct. 17 and 18, the following officers were elected for the ensuing year, to wit: President, J. F. Adams, Worcester, Mass.; Vice-President, L. Noble, Springfield, Mass.; Second Vice-President, L. C. Taylor, Hartford, Conn.; Secretary, C. T. Stockwell, Springfield, Mass.; Treasurer N. Morgan, Springfield, Mass.; Executive Committee, C. A. Brackett, Newport, R. I.; J. S. Hurlbut, Spring-

field, Mass.; J. J. Anderson, Springfield, Mass.

Plant Anæsthesia.

The curious discovery has recently been made that anæsthesia may take place not only in animals but in plants, and, in brief, in all forms of life. It has been demonstrated that etherization acts finally on all the tissues of animals and on the central nervous system. Hence, if plants have tissues, the anæsthetic should equally act on them. This substantially appears to be the case; and every vital act, whether occurring in animal or vegetable, may be anæsthetized. In plants, M. Claude Bernard, to whom is due the credit of the discovery, has found that germination ceases under the influence of ether. He introduced

water cresses, which germinate from day to day, into two precisely similar tubes. In one tube he placed a little ether. The plant therein on the following day was found not to have germinated, as the other had; but after being removed from the anæsthetic, the first went on and germinated in a natural manner. The plant had literally been put to sleep.

The same is true of ferments; for beer yeast, after contact with ether for twenty-four hours, completely loses its activity, and yet regains it as soon as the etherization is stopped.

New Chemical Test for Alcohol.

Professor E. W. Davy, of Ireland, is the author of a new and very delicate chemical test for alcohol, which promises to be of much practical utility. The substance he uses is a solution of molybdic acid in strong sulphuric acid. When alcohol is brought into contact with this solution, a deep azure blue color is quickly developed. The test is so delicate that the presence of alcohol, in so small a quantity as the one thousand six hundred and sixty-sixth part of a grain in a drop of distilled water, is at once revealed.

The new test will be useful in detecting frauds in the preparation of various medicinal and chemical substances. For example, pure chloroform, owing to its high price, presents a temptation to fraud, and is often adulterated with cheap alcohol. The consequences, to the sick, are apt to be deplorable, sometimes fatal. By the new test, if there is so small a quantity as one part of alcohol in one thousand in the chloroform, the presence of the alcohol is at once made known.

Proposed Retention of the Main Centennial Building.

It now seems probable that the Main Building at the Centennial Exposition will not be torn down after November 10, but will be allowed to remain for permanent

exhibition purposes. A request of this kind from prominent citizens of Philadelphia was recently made to the Fairmount Park Commission, but was refused. A conference committee has, however, since been allowed, and the matter has been so forcibly urged that the Commission, it is believed, will reconsider its determination. The building is excellently suited for the purpose intended, much better so, indeed, than Machinery Hall, which was at first proposed. It is strong, and will stand for twenty years if provided with a tin roof and otherwise cared for. Several of the foreign governments have expressed their willingness to allow their exhibits to remain, and some foreign exhibitors will even increase their displays. About six hundred thousand dollars are required for the enterprise, half of which, we learn, is already subscribed, and the remainder is easily obtainable. The idea is an excellent one, as a great permanent show in which new devices of all kinds can be expeditiously introduced to the public has long been needed. We trust the plan may meet with every success.

Chinese Immigration.

Although the excitement growing out of the Chinese immigration has largely subsided, the inflow of Mongolians continues steadily. Official returns made to the Bureau of Statistics show that during the fiscal year ended June 30, 1876, there arrived in the United States 22,572 Chinese immigrants, of whom 259 were females. During the corresponding period of 1875, the total immigration to the United States from China was 16,437, of whom 82 were females.

Cement for Water-tight Wood Vessels.

A mixture of lime clay and oxide of iron separately calcined and reduced to powder, intimately mixed, kept in a close vessel, and mixed with water when used.

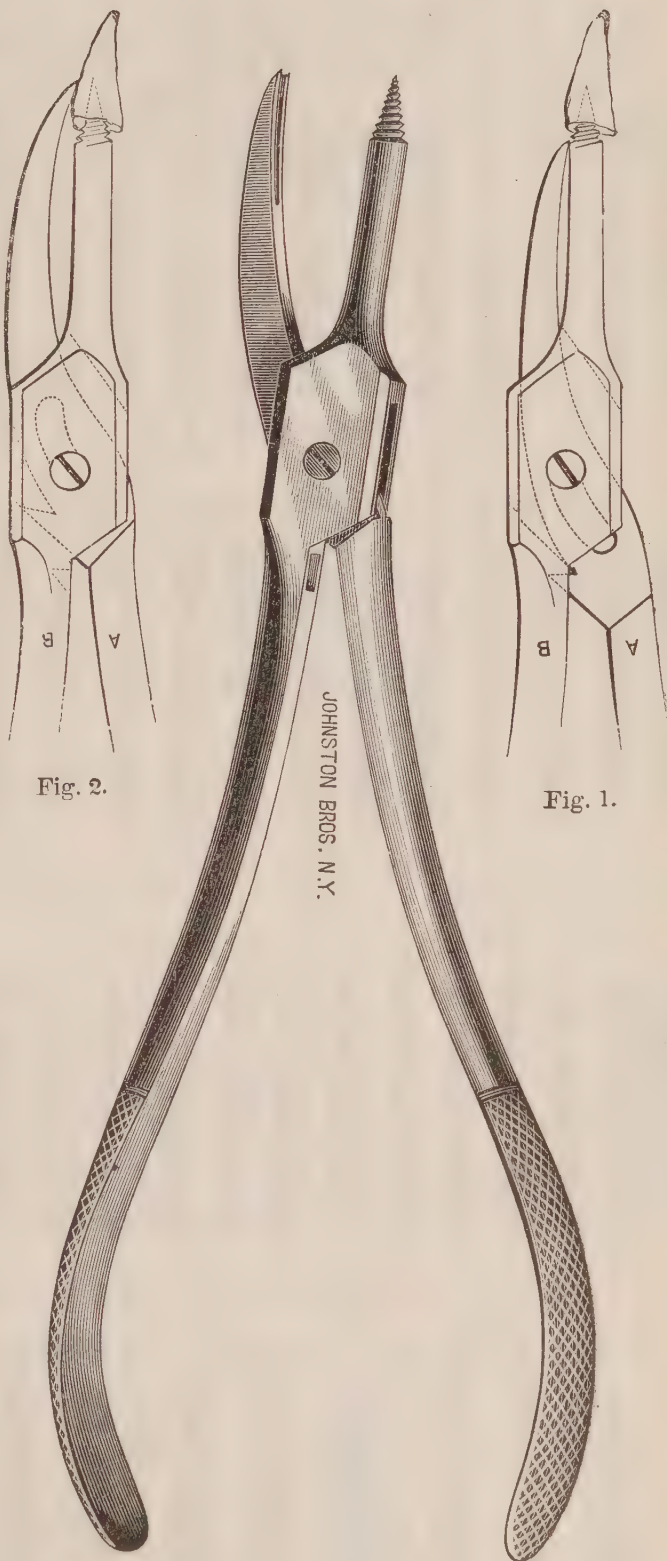
FRENCH ROOT FORCEPS.

Patented Dec. 2, 1873.

These Forceps, the invention of Dr. C. G. French, are designed to do the work of the Hullihen Forceps, and will be found much simpler and more effective instruments. As shown in Fig. 1, the jaw opposite the screw is drawn back so that the screw may be readily inserted in the root. The jaw when withdrawn is prevented from sliding forward by the catch between the handles shown in each outline cut. After the screw is firmly seated in the root, it is only necessary to disengage the catch, and see that the free jaw bears squarely on either the labial or lingual surface of the root (choose the stronger), when by simply closing the handle, the free jaw is forced by the cam action of the joint down into the socket, thus bringing it opposite the screw, when of course the root may be readily withdrawn. It will be seen that with these forceps it is not necessary to lacerate the gums or crush through the alveola, as the sharp point of the jaw is forced forward *along the side* of the root by the action of the joint, cutting the root clear on that side, and at the same time loosening it by its wedging action.

PRICE, NICKEL-PLATED, \$3.50.

JOHNSTON BROS., 812 Broadway, N. Y.



CATALOGUE OF Instruments for Dental Engines.

Each Bur will fit either the Morrison, Suspension or White Engine.

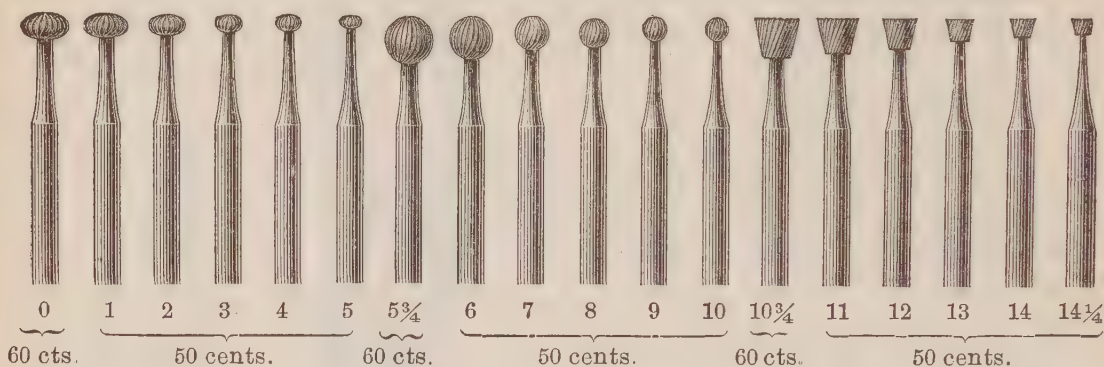
Patented September 10, 1872, February 24, 1874.

PLUG FINISHING BURS.

Oval.

Round.

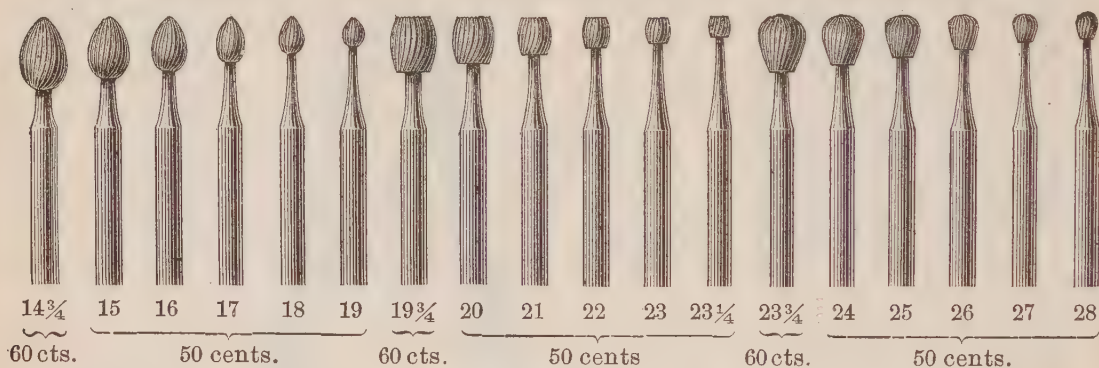
Inverted Cone.



Bud Shape.

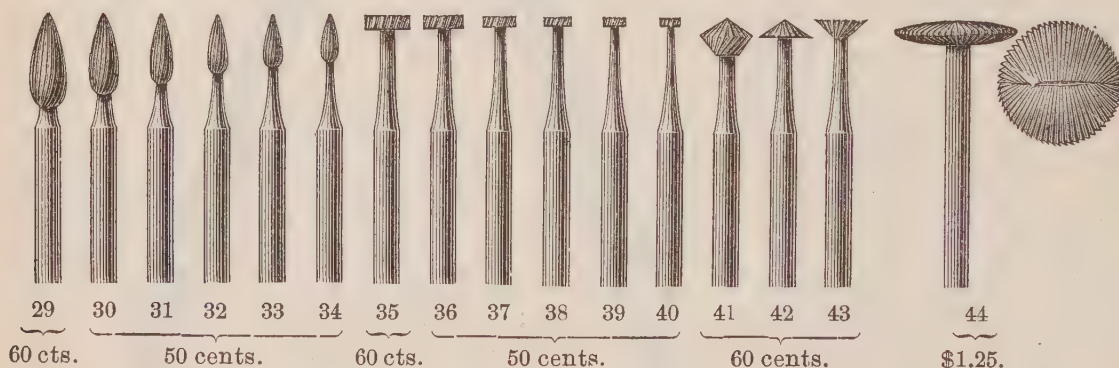
Barrel Shape.

Pear Shape.



Flame Shape.

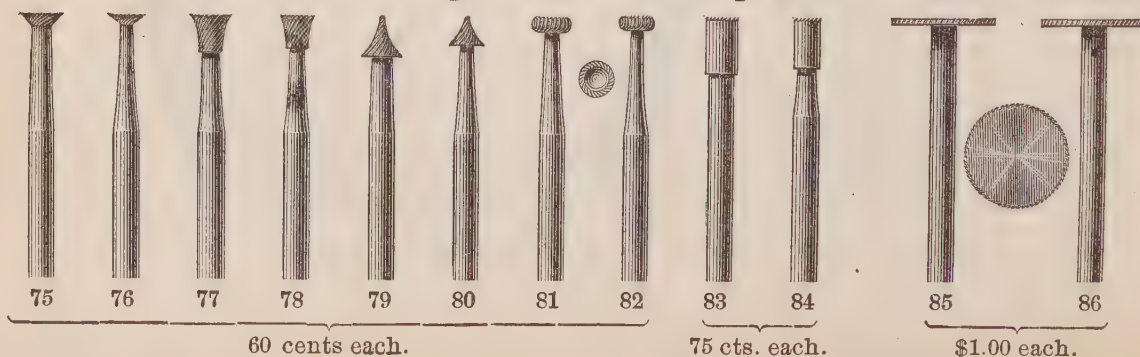
Wheel Shape.



New Forms Finishing Burs.

Trephines.

Plate Saws.

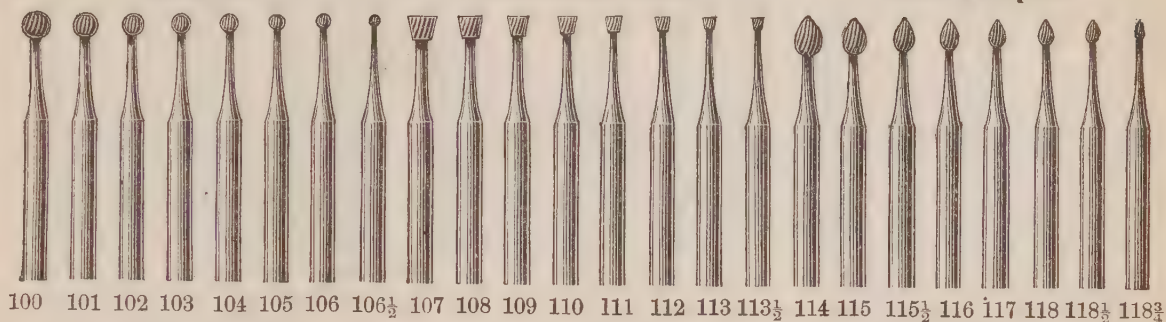


CAVITY INSTRUMENTS.

Round.

Inverted Cone.

Bud Shaped.



25 cents each.

25 cents each.

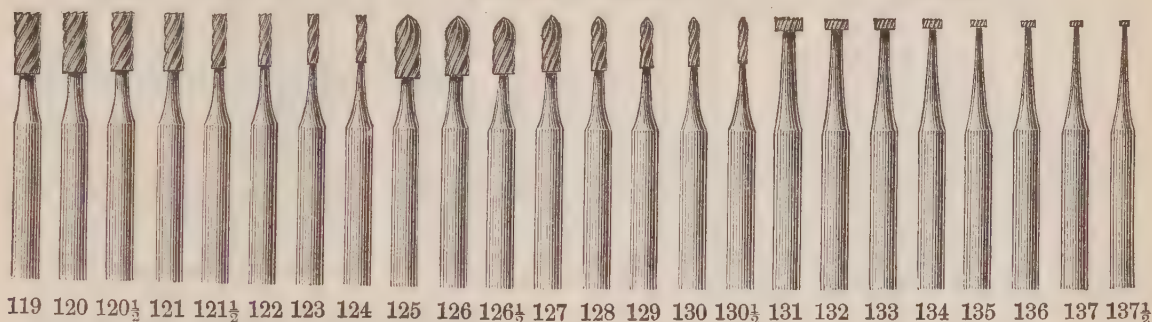
25 cents each.

For extra large sizes of these forms see below, Nos. 154 to 177.

Square Fissure.

Pointed Fissure.

Wheel.



25 cents each.

25 cents each.

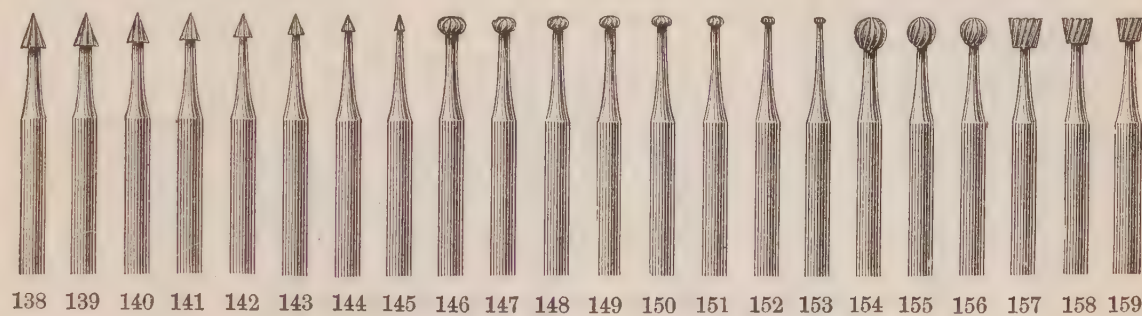
25 cents each.

For extra large sizes of these forms see below, Nos. 154 to 177.

Cone Shaped.

Oval.

Extra Sizes.

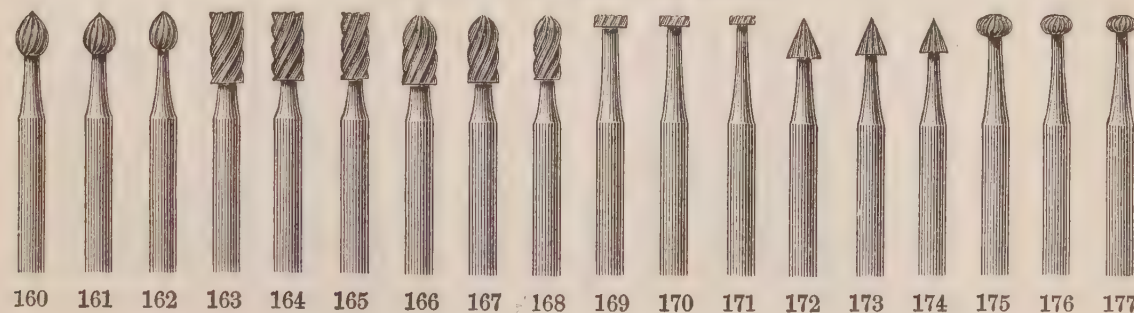


25 cents each.

25 cents each.

35 cents each.

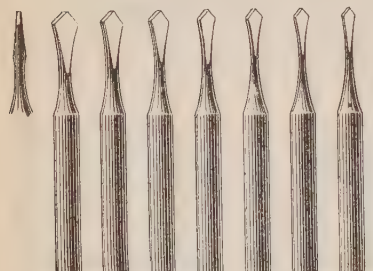
Extra Sizes of Various Shapes.



35 cents each.

CAVITY INSTRUMENTS.

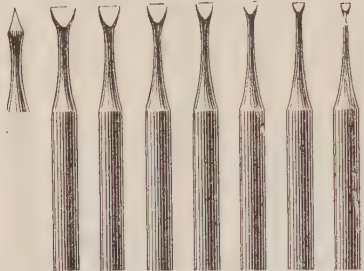
Spear Shaped Drills.



200 201 202 203 204 205 206

25 cents each.

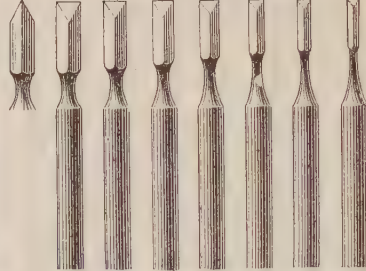
Spade Drills.



207 208 209 210 211 212 213

25 cents each.

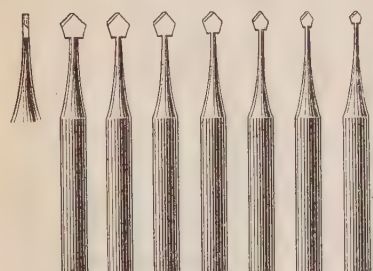
Square Drills.



213 1/2 214 214 1/2 215 216 217 218

25 cents each.

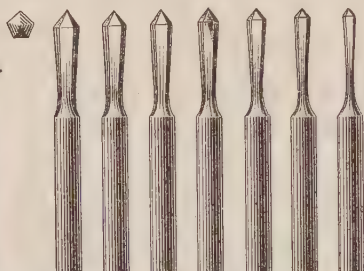
Forbes' Drills.



260 261 262 263 264 265 266

25 cents each.

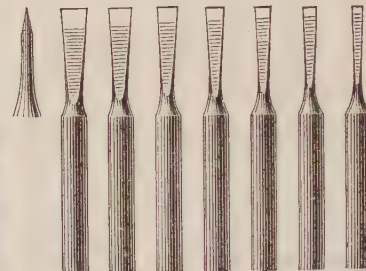
Five Sided Drills.



267 268 269 270 271 272 273

25 cents each.

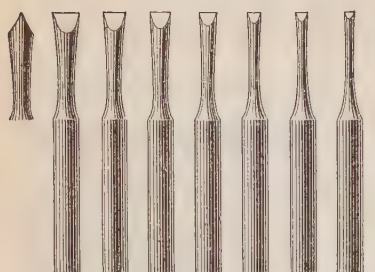
Flat Drills.



274 275 276 277 278 279 280

25 cents each.

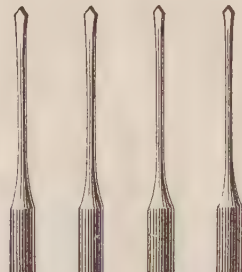
Round Drills.



281 282 283 284 285 286 287

25 cents each.

Drills for Mack's Screws.



288 289 290 291

40 cents each.

No 291 is for Gold Screw No. 1

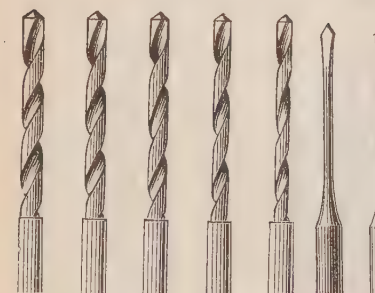
" 290 " " " " 2

" 289 " " " " 3

" 288 " Pivoting Screws.

NERVE INSTRUMENTS.

Twist Drills.



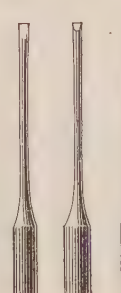
219 220 221 222 223 224 225

Spear Point Drills



226 227 228

Round Drills



229 230 231

Round Burs.



232 233 234

Flame Shape Burs.



235 236 237

Cone Burs.

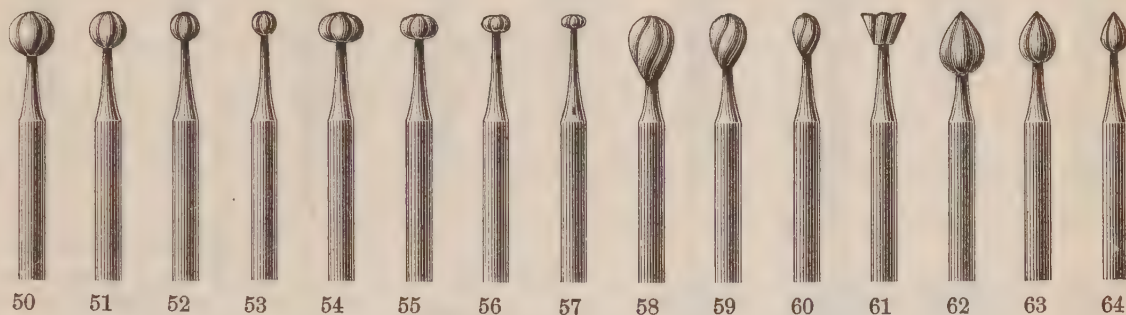


238 239 240

40 cents each.

Miscellaneous Finishing Instruments.

Burnishers.



75 cents each.

Same sizes, not corrugated, 50 cents each.

Screw Mandrel, without Collar.



No. 65.

13 cents.

Plain Chuck for Wood Points.



No. 69.

Plated, 35 cents each.

Plain, 25 " "

Screw Mandrel.



No. 66.

25 cents each.

Port Polisher.



No. 67.

Screw Socket, Nickel Plated, 35 cents each.



Parting Nut Mandrel.

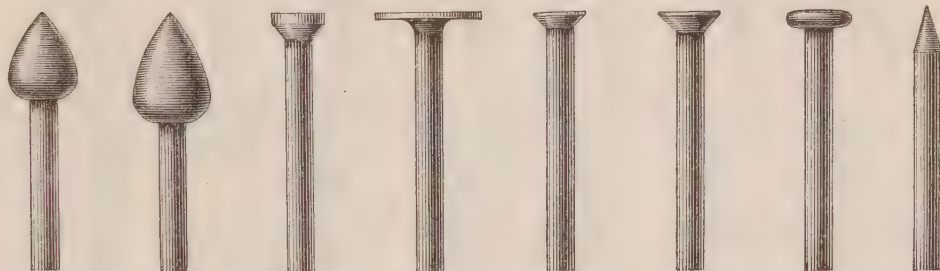


No. 68.

Nickel Plated, 40 cents each.

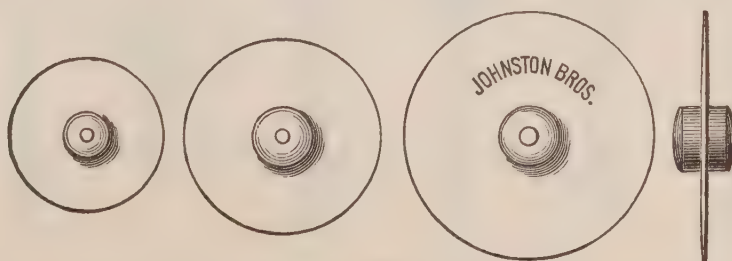
Plain, 30 " "

Wood Polishing Points.



Per Box of 100, assorted, \$1.25.

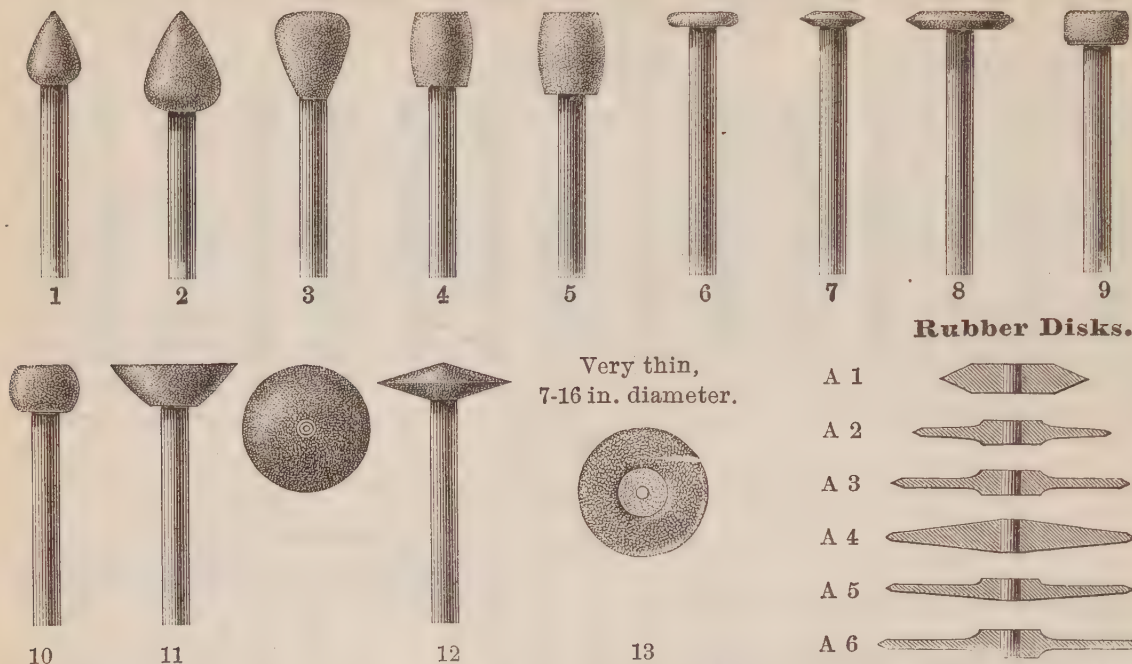
Boxwood Disks.



Price, per dozen, \$1.00.

CORUNDUM POINTS.

Forms by Dr. A. L. Northrop.



Mounted, per set.....\$1 50
 Mounted, per dozen..... 1 50
 Not Mounted, per set..... 75
 Not Mounted, per dozen..... 75

Wheels as in cut No. 13, per dozen... ..\$1 50
 Or Mounted, per dozen..... 2 75
 Rubber Disks, Hard, per dozen } 1 20
 Rubber Disks, Soft, per dozen }
 Soft Rubber Points, Shapes of Corundum Points, per dozen.....75 cents.

ARKANSAS AND HINDOSTAN STONE.

These are kept in stock, mounted on Mandrels, of the forms represented below. Scotch Stones will be made to order of any of the same forms, but this Stone is so soft, that we do not deem them desirable except for such shapes as are without sharp angles.



Arkansas Stones, \$1.00 each. Hindostan Stones, 50 cents each. Scotch Stones, 30 cents each.

STONED BURS.

The teeth of these Burs are laid out with great accuracy, and then filed to *exactly equal length*, but are not brought to a cutting edge. The Bur is next tempered, and each tooth *afterward* stoned to a fine edge. This secures a Bur perfect in all its cutting edges, and unequaled by anything of the Bur kind. Those who have used these most, rarely buy any other kind, and assure us that they find true economy, as well as great satisfaction in their use.

We invite the fullest examination of all of our Engine Instruments, as regards

The quality of the steel from which they are made.

The shape and finish of the cutting edge:

Their temper.

The rapidity with which they cut.

Their durability.

The shaft of each instrument is *round and highly finished*, and can therefore be used without unreasonable and unnecessary injury to the nose of the hand-piece, which injury occasions unsteadiness in all the uses of the Engine.

They will *bear examination in quality and price.*

MINIM BURS.

It is impossible to accurately represent by cuts the smallest sizes of Burs that we make. We offer Cavity Burs, either Round, Inverted Cone, Bud-Shaped, Wheel, Cone-Shaped or Oval, of smaller sizes than are represented or numbered herein. Although more than ordinarily expensive to make, **we keep the price the same as for ordinary Cavity Burs.** In sending orders, please specify the shape desired, as for example: "ONE DOZEN ROUND MINIM BURS."

SPECIAL OFFER.

A discount from list prices of ten (10) per cent. will be given on all cash orders for Engine Instruments which amount to twenty-five dollars or upwards.

PRICES OF ENGINE EQUIPMENTS.

Plug Finishing Burs.....	\$6 00	per doz.	50 cts. each
Extra Size Finishing Burs.....	7 20	"	60 "
Stoned Finishing Burs.....	12 00	"	1 00 "
Extra Sizes proportional prices.			
Excavating or Cavity Burs.....	3 00	"	25 "
Extra Sizes.....	4 20	"	35 "
Stoned Excavating or Cavity Burs.....	6 00	"	50 "
Stoned Excavating or Cavity Burs, Extra Sizes proportional prices.			
Minim or very Small Burs , Round, Bud, Wheel,			
or Cone shaped	3 00	"	25 "
Right Angle Cavity Burs and Drills.....	3 00	"	25 "
Trephines.....			75 "
Screw Mandrels, with Collar.....	3 00	"	25 "
Screw Mandrels, blanks (no collar), for Mounting Wooden			
Wheels, Leathers, &c.....	1 50	"	13 "
Large Knife Edge Wheel Burs.....			1 25 "
Plate Saws.....			1 00 "
Burnishers, Corrugated.....	9 00	"	75 "
Burnishers, Smooth.....	6 00	"	50 "
Parting Nut Mandrels, Nickel Plated.....	4 80	"	40 "
Parting Nut Mandrels, plain.....	3 60	"	30 "
Drills of all forms and sizes (except Nerve Drills).....	3 00	"	25 "
Nerve Instruments.....	4 80	"	40 "
Leathers, Mounted.....	3 00	"	25 "
Leathers, not Mounted.....	1 00	"	10 "
Bands for Engine, Morrison.....	1 20	"	10 "
Bands for Engine, Suspension.....	1 80	"	15 "
Ive's Tongue and Cheek Protectors (2 sizes), to be used			
with disks, wheels, &c..... per set.	1 50		75 "
Right Angle Attachments.....			5 00 "
Arkansas Stones, Mounted.....	12 00	"	1 00 "
Hindustan " ".....	6 00	"	50 "
Scotch " ".....	3 60	"	30 "
Corundum Points, Mounted.....	1 50	"	13 "
Corundum Points, not Mounted.....	75	"	7 "
Rubber Disks, hard or soft.....	1 20	"	
Twist Drills.....	4 80	"	40 "
Boxwood Disks (3 sizes, see cut).....	1 00	"	10 "
Wood Socket or Port Polisher, plain.....			25 "
Wood Socket or Port Polisher plated.....			35 "
Wood Socket or Port Polisher, Screw Socket.....			35 "
Corundum Wheel, No. 13, $\frac{7}{16}$ in. diameter.....	1 50	per doz.	13 "
Soft Rubber Points, shape of Corundum Points.....			75 cts. per doz.
Wood Polishing Points.....			\$1 25 per Box.

We are prepared to furnish any of the instruments illustrated in this pamphlet, adapted to either the A, B, or C style Hand Piece. The C style Instrument also fits the S. S. White Engine.

In ordering instruments, designate them by the numbers, and state whether they are wanted to fit the (A,) (B,) or (C) hand-piece. Each bur is numbered on its shank.

Style A.



Style B.



Patented Sept. 10, 1872.

Style C.



Patented Feb. 24, 1874.

NOTE.—To fasten Burs in the Hand Piece, it is well to push back the catch-spring with the left hand while inserting the Bur with the right hand.

JOHNSTON ADJUSTABLE FOUNTAIN SPITTOON.



The defects of the Fountain Spittoons hitherto made are, that it is almost impossible to keep them from leaking, and that they occupy a rigid position close to the left of the chair, and hence prevent the operator from working on that side.

These defects will not be found in this spittoon, which is commended to the favor of Dentists by the following points of merit:

1st. It is readily adjustable to the position of the chair; that is, it can by an easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches to the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient, the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way.

3d. Instead of a wooden case, twelve inches square, is an ornamented metal tube one and a half inches in diameter, which will not warp, occupies very little room.

4th. Movable joints are so arranged that any leakage is impossible, since the waste from the bowl never comes to the joint itself, but is discharged below, in the bottom of the lower half of the socket of the globe, and conveyed into the waste pipes.

5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

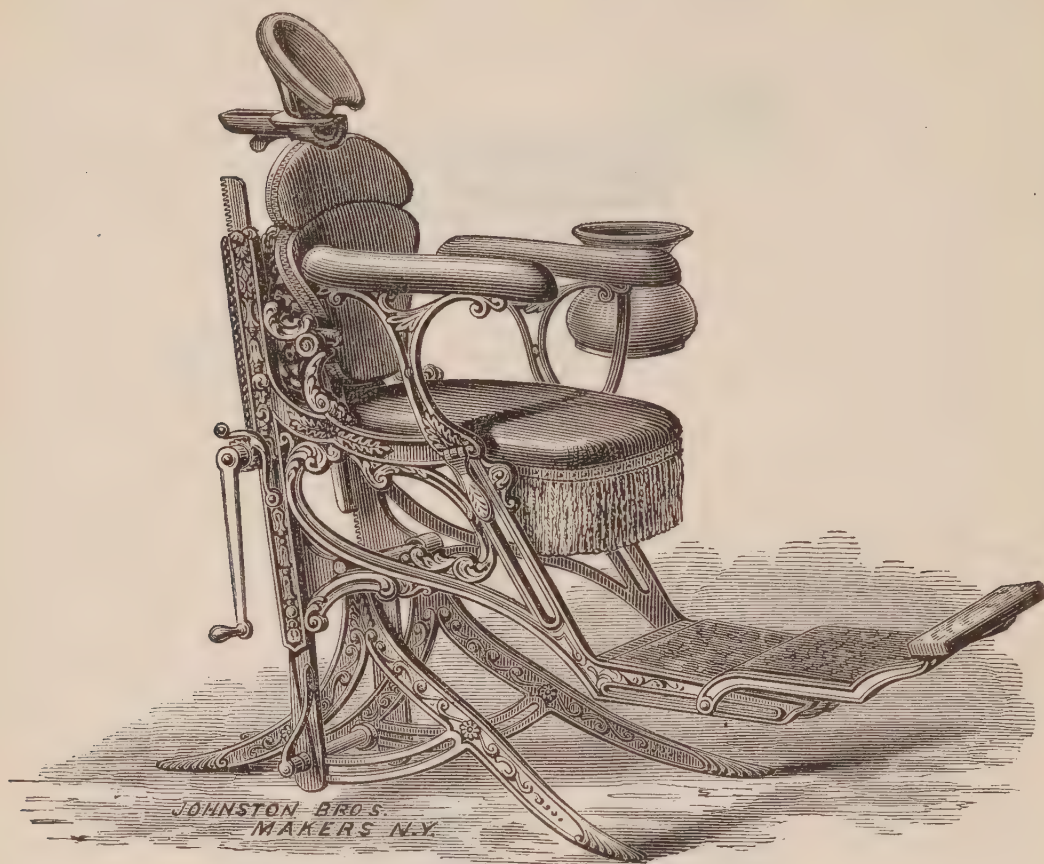
6th. All its bright parts are of gun metal, and its tubing silk covered.

The water jet used is the device of Dr. Redman, of Louisville, Ky.

Price.	\$60.00
Boxing.	2.00

JOHNSTON BROTHERS, 812 Broadway, N. Y.

The Morrison Dental Chair.



Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator :

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient :

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure for those who may so desire *the rotary movement*, some of these chairs have legs, into which castors are cast. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and as pictured on the chair has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of \$8.00.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

PRICES.

In fine green or garnet plush—with Morrison Head-rest.....\$ 150.00

Boxing..... 5.00

To which price add, if ordered :

With Castors.....10.00

With Johnston Head-rest, instead of Morrison..... 8.00

With extra back-pad..... 4.50

With spittoon attachment and porcelain cuspador..... 8.00

With nickled metallic cuspador and gold trap.....10.00

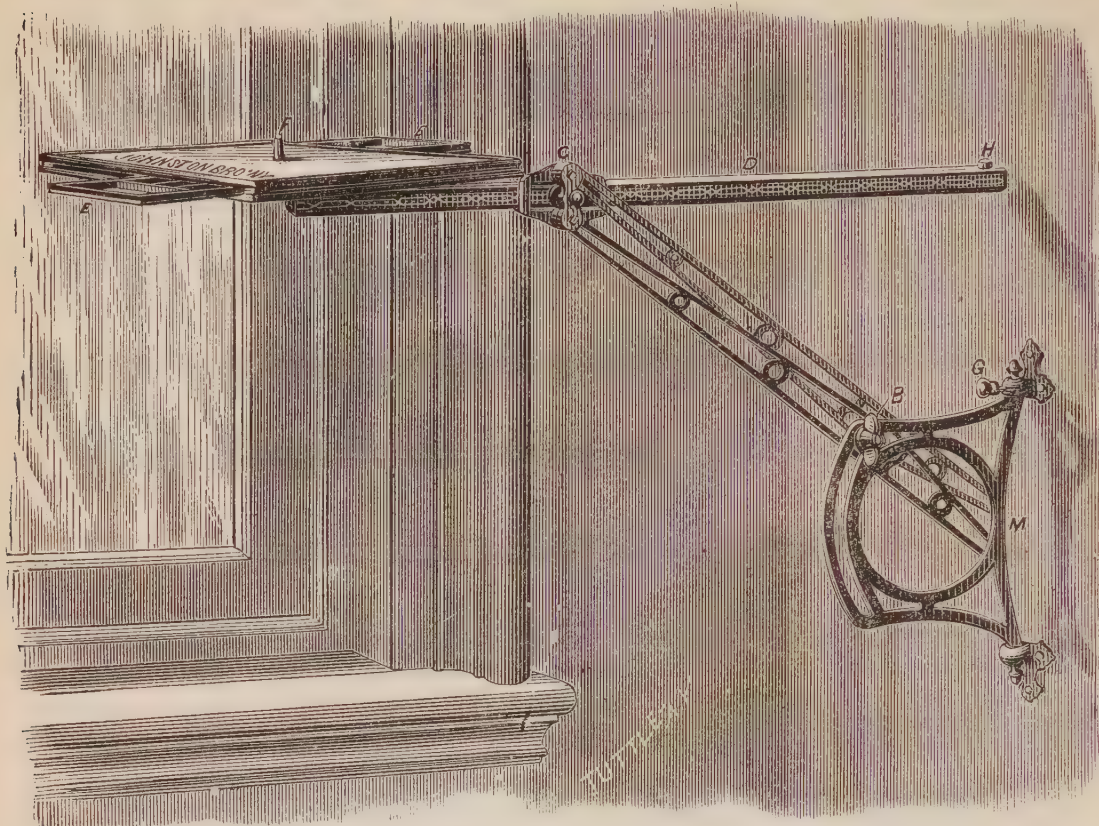
With Turkish upholstery.....15.00

Real morocco embossed.....10.00

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

MORRISON DENTAL BRACKET



PRICES.

With Black Walnut Table, 12 inches square.....	\$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather.....	40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket.....	17.00.
Boxing.....	\$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

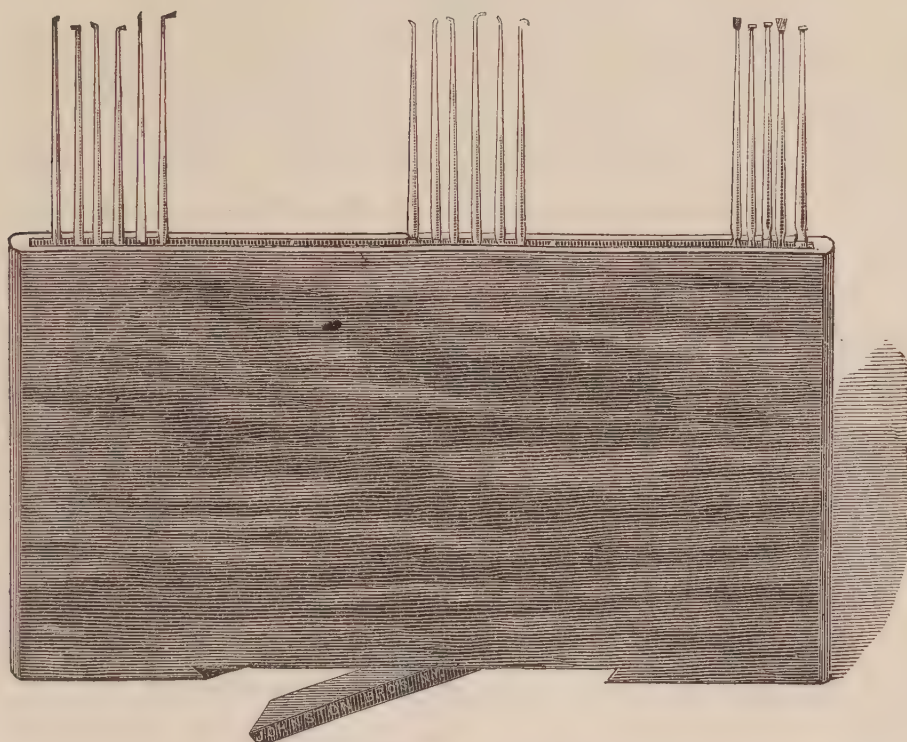
- 1st. It combines a greater variety of range and movement than any other.
- 2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
- 3d. It provides a clean receptacle for foil and instruments.
- 4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
- 5th. Its drawers extend through the table and can be opened from either side.
- 6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

Fitch's Instrument Stand.



Both time and money are saved by any arrangement by which a dentist's tools are so distributed that he can at a glance recognize, and conveniently lay hold of any desired point.

It is a further convenience, if, when night comes, he may lay them in his drawer secure from dust without disarranging them. Dr. Fitch, of Lee, Mass., has designed an instrument stand for hand tools which combines these advantages. When placed on the table for use it is firm in its upright position, and the point of each instrument in it is distinctly presented to view. When its foot is closed into its base it is but 5-8 of an inch thick, and can be laid flat in any drawer without disturbing the instruments.

We make two sizes—No. 1, for excavating burs, &c., having 3-16 inch handles ; No. 2, for pluggers, &c., having 3-8 inch handles.

Price of each.....\$1.50

JOHNSTON BROTHERS,
812 Broadway, N. Y.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

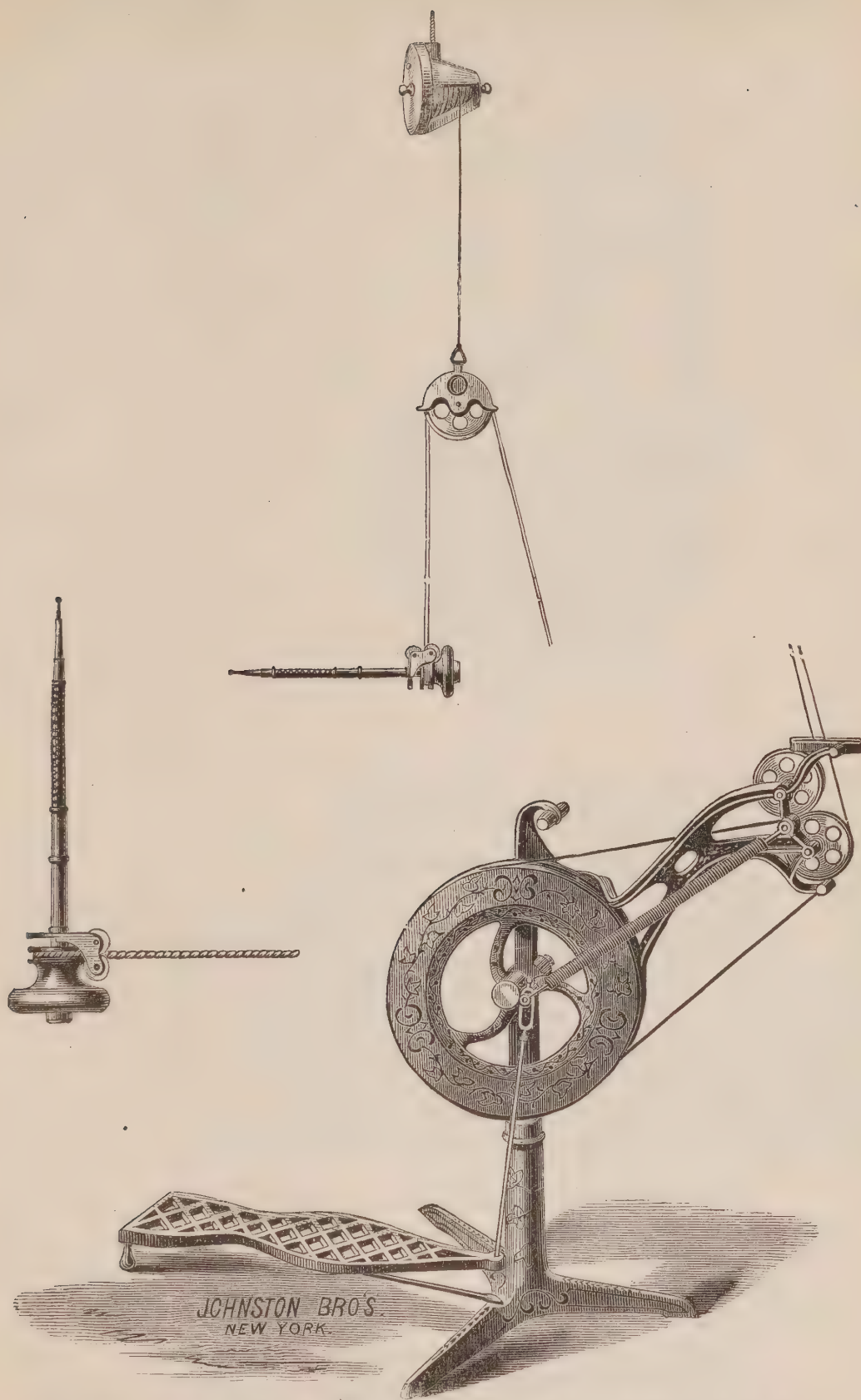
In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or "chattering" which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

- 1st. It is more steady in its movement than any Engine made.
- 2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.
- 3d. It has an abundance of power.
- 4th. It is not easily broken or likely to need repairs.
- 5th. It is, above all others, a "*light running*" Engine.
- 6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROTHERS, 812 Broadway, N. Y.



JOHNSTON BROS.
NEW YORK.

SUSPENSION DENTAL ENGINE.

(DR. ELLIOTT'S INVENTION.)

Price, \$50.00. Right Angle Attachment, \$5.00. Boxing, \$1.00.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($\text{NO}^2 + 2\text{O} = \text{NO}^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid Nitrous Oxide*, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether	I	death to 23,204 administrations.	
Chloroform	I	" 2,723	"
Mixed Chloroform and Ether	I	" 5,588	"
Bi-chloride of Methylene	I	" 7,000	"
NITROUS OXIDE		no Deaths in 75,000	"

Edward R. Squibb, M.D., than whom our country has no more able pharmacist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

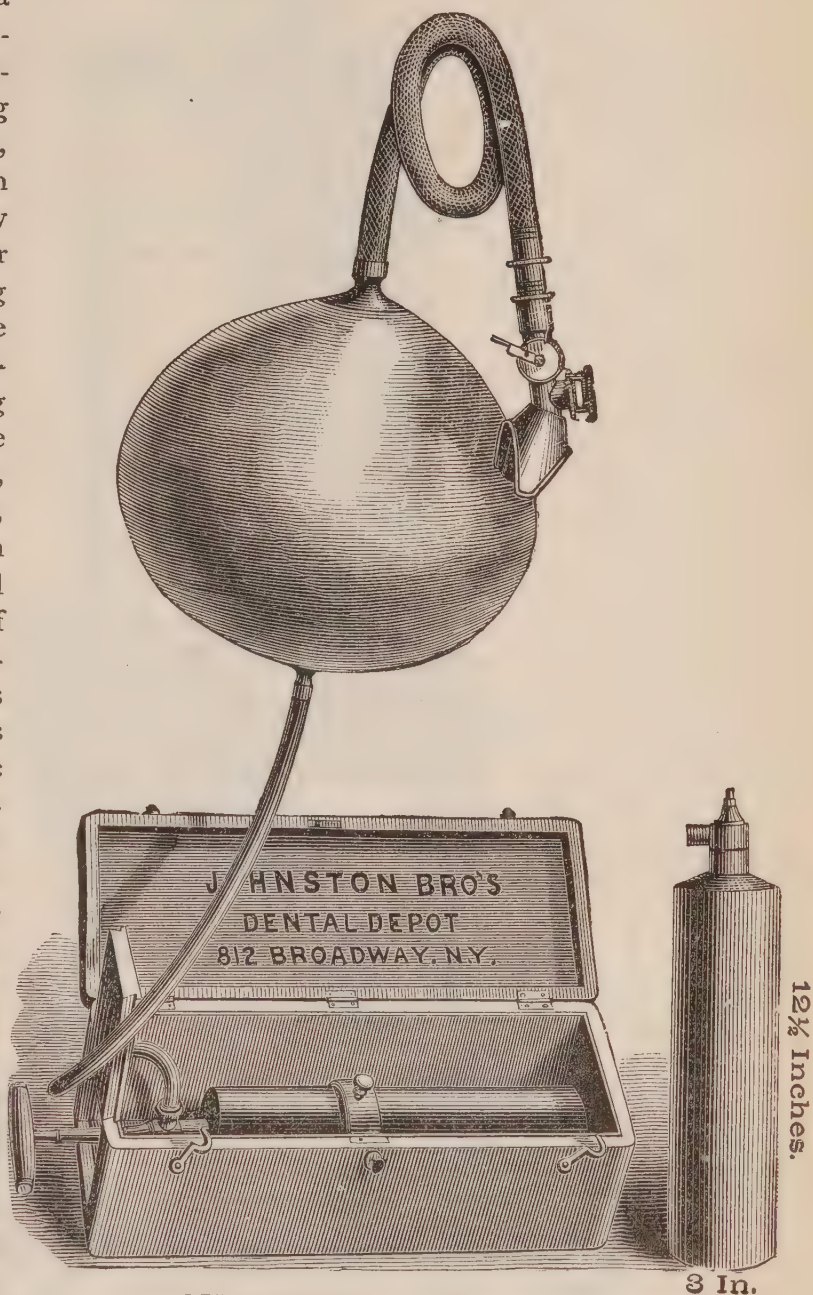
Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

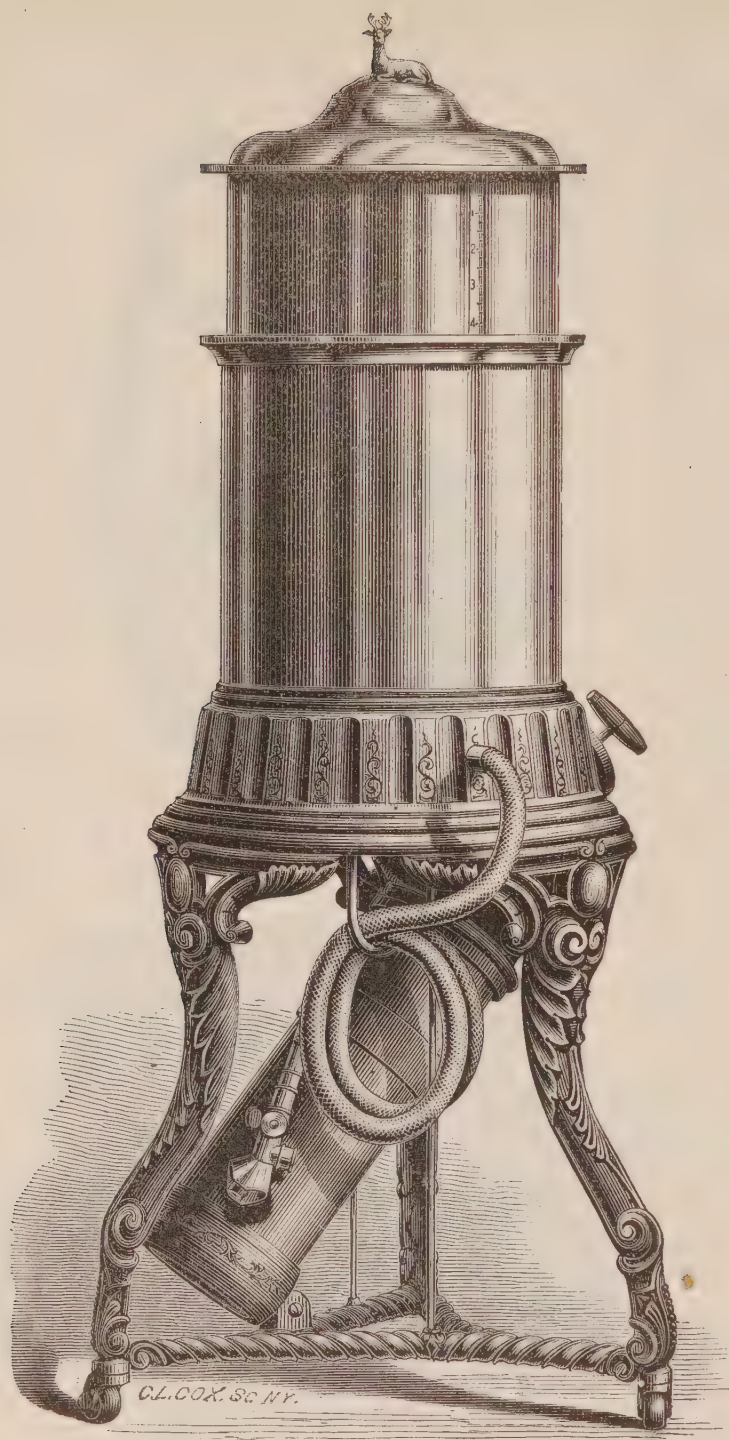
Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers

without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.



NICKEL-PLATED GASOMETER

AND ORNAMENTED STAND

FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas—this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality*.

JOHNSTON BROS., 812 Broadway, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler **No. 1** \$42 00

Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic

Inhaler **No. 2** 45 00

Boxing either, \$1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas 16 00

Refilling Cylinder 6 00

Nickel-Plated Gasometer, with ornamented iron stand 128 00

Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered

Tubing) 12 00

1000 Gallon Cylinder 36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of $4\frac{1}{2}$ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at $4\frac{1}{2}$ cents 45 00

Morocco covered case, with ring and thumb screw, velvet lined 12 00

Polished bl'k walnut “ “ “ “ “ 13 00

Or these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity) 5 00

Rubber Bag, with covered inhaler tubing, extra size 7 00

Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection 9 50

Key, Nickel Plated 1 50

Wrench, “ “ 50

Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag 1 50

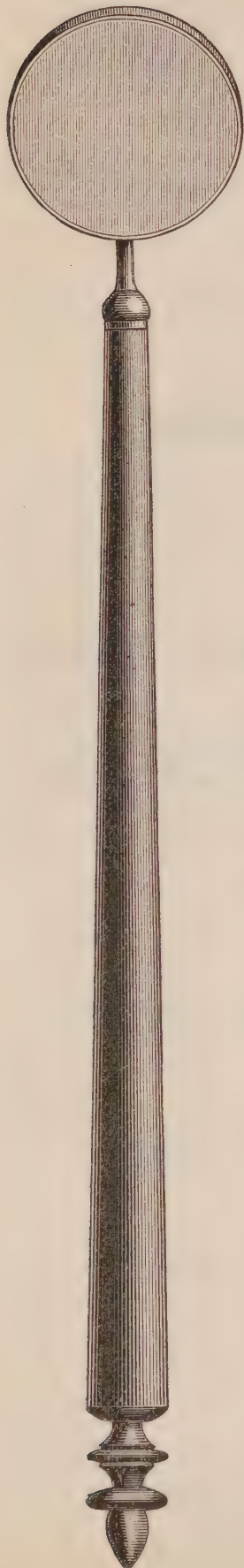
Covered Inhaler Tubing, per foot 50

Plated Connection to fit old style Inhaler 1 00

JOHNSTON BROS.,

812 Broadway, N. Y.

MOUTH MIRRORS.



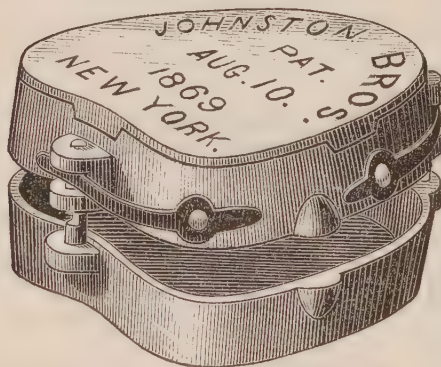
Our own make—thoroughly tested. They are first heavily coated with silver, then protected carefully by a deposit of copper, as are the imported glasses known as “the imperishable,” then mounted in a nickel-plated frame.

PRICES.

Plain, with ebony handles, $\frac{1}{2}$ to 1 in. diam.	\$1.00
Magnifying, “ “ “ “	2.00
Plain, with ivory “ “ “ “	2.50
Magnifying, “ “ “ “	3.00

JOHNSTON BROS.,
812 Broadway, N. Y.

SELF-LOCKING FLASK. (PATENTED.)



This flask has been long tested with celluloid in actual use. It may also prove useful in rubber work, in which case it should be closed before being put into the vulcanizer.

POINTS OF MERIT:

1st. By its use one obviates the necessity of waiting to cool his heater before proceeding with a second case, since, when the flask is once closed, it locks itself, the screw may be loosened up, and the case and can be immediately removed from the heater.

2nd. The click made by the spring as it drops into its socket announces that the flask is closed and the piece cured.

3d. This feature secures the dentist against the carelessness of an assistant, as should the flask fail to close, the fact could not escape his attention.

PRICE.

Brass\$2.50

JOHNSTON BROS.,
812 Broadway, N. Y.

FOIL TWEEZERS.

A thoroughly made article. They can be had with straight points as represented above, or with curved points. Prices :

Plain.....\$1 00

Nickel Plated..... 1 50

JOHNSTON BROS.

WOOD STRIPS.

Cotton Wood, per bundle. 20 cents

Box Wood “ “ 12 “

Orange Wood “ “ 10 “

JOHNSTON BROS.

DENTAL PICTURES.

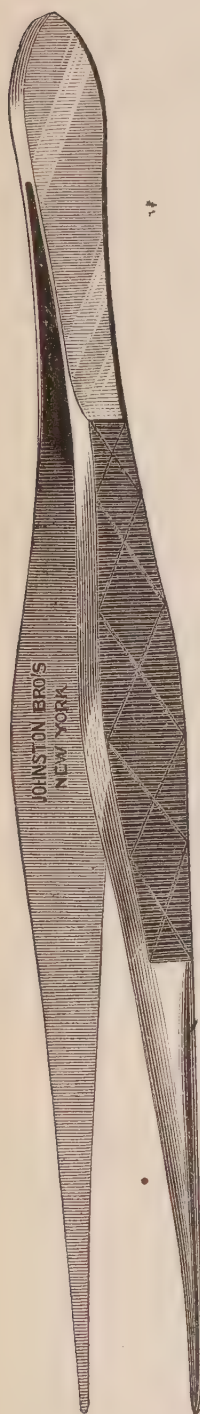
Pictures on Dental subjects are not very numerous, and will always possess interest to practitioners of dentistry. Having reproduced several copies of ancient paintings and engravings, illustrative of dentistry in other countries and in olden time, as frontispieces for the DENTAL MISCELLANY, we have, at the request of friends, also printed them upon plate paper, in suitable form for framing or for preservation in a portfolio.

Those now ready are—

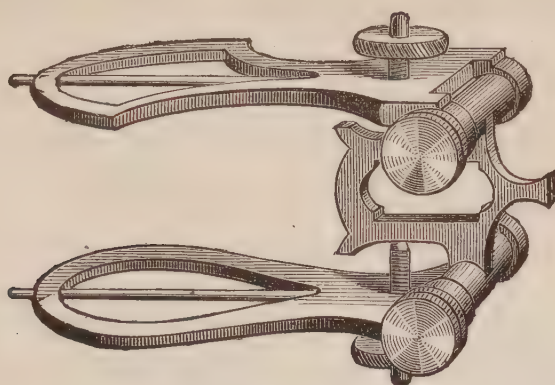
1. Der Zahnarzt—From a Steel Engraving of 1672.
 2. The Tooth Drawer—English.
 3. The Monkey as a Dentist—from a painting by DeCamps, 1840.
 4. Der Zahnbrecker—From a German Plate.
- Price each, by mail.....50 cents.

JOHNSTON BROS.,

. 812 Broadway, N. Y.



ELLIOTT ARTICULATOR.



Price \$3.00.

Points of Merit in the Elliott Articulator:

BY W. S. ELLIOTT, D.D.S., M.D.S

1st. Mechanical simplicity.

2nd. Impossibility of disarrangement of *bite*.

3d. Easy adaptation to all cases.

To use it observe the following DIRECTIONS: Next after the bite has been taken, turn the jaws of the Articulator each upon the other, forward or backward, according as you have a close or wide articulation, at the same time turn the set screws back so that they will be entirely free, when it will be observed that either jaw can be thrown *endwise*, forward or backward at pleasure. Set the cast upon either jaw and adjust the other to the most desirable position. Secure with a very little plaster; when *set* turn down the screws until they touch the inner frame. The entire arrangement is now firm and immovable, except the *open and shut*.

Trim the plaster closely and neatly to the jaws. If it is desired to remove the model, seize the projecting end of the central steel wire, withdraw it, when the model can be removed with ease.

JOHNSTON BROS.,

812 Broadway, N. Y.

ENGLISH PINK RUBBER.

We offer 1 x <i>pink</i>	\$8.00	per lb.
I	8.00	"
White.....	6.50	"
Black.....	3.50	"

JOHNSTON BROS., 812 Broadway, N. Y.

FLOSS SILK.

We offer a fresh lot of unsurpassed quality as regards strength, uniformity and fineness of fibre. Each spool contains twelve yards.

Price per spool.....	.15
Price per dozen.....	.\$1.50

JOHNSTON BROS, 812 Broadway, N. Y.

NEW YORK COLLEGE OF DENTISTRY,

1876-77.

FACULTY.

FANEUIL D. WEISSE, M.D., Professor of Regional Anatomy and General Pathology.

FRANK ABBOTT, M.D., Professor of Operative Dentistry and Oral Surgery.

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C. A. MARVIN, D.D.S., Professor of Mechanical Dentistry.

WILLIAM H. ALLEN, Clinical Professor of Operative Dentistry.

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J. BOND LITTIG, D.D.S., Clinical Professor of Mechanical Dentistry.

D. W. WILLIAMSON, D.D.S., Demonstrator of Operative Dentistry.

A. RUST CUYLER, D.D.S., Demonstrator of Mechanical Dentistry.

C. P. KREIZER, M.D., Assistant to the Professor of Chemistry, Materia Medica and Therapeutics.

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Monday, October 4th, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, } Matriculation, Demonstrators', Diploma Fees, and practice in the } Infirmary the seven and one-half months between the sessions... }	\$150.00
For the Course of Lectures only.....	100.00
Matriculation.....	5.00
Graduation Fees.....	30.00

Board may be obtained for from \$6 to \$8 per week.

For further information, address

FRANK ABBOTT, M.D., Dean,

12 West Nineteenth Street, New York.

HARVARD UNIVERSITY.

Dental Department.

BOSTON, MASS. 1875-76.

FACULTY.

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OLIVER W. HOLMES, M.D., Professor of Anatomy.
HENRY J. BIGELOW, M.D., Professor of Surgery and Clinical Surgery.
THOMAS H. CHANDLER, D.M.D., Professor of Mechanical Dentistry.
GEORGE T. MOFFATT, M.D., D.M.D., Professor of Operative Dentistry.
LUTHER D. SHEPARD, D.D.S., Adjunct Professor of Operative Dentistry.
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IRA A. SALMON, D.D.S., University Lecturer on Operative Dentistry.
CHARLES B. PORTER, M.D., Demonstrator of Practical Anatomy.
CHARLES WILSON, D.M.D., Demonstrator in Charge.
GEORGE F. GRANT, D.M.D., Demonstrator of Mechanical Dentistry.

The Ninth year of this School begins on the 28th of September and continues till the last Wednesday in June. The distinction of Summer and Winter sessions being hereafter abolished. It will be divided into two equal terms, with a recess of one week at Christmas. The course of instruction will be progressive, extending over two years, the lectures of one year not being repeated in the next.

The regular examinations will be held in the following order, viz.: At the end of the first year, anatomy, including dissection, physiology and general chemistry. A certificate from the demonstrator of anatomy will be required of each student, that he has satisfactorily dissected the three parts of the body.

At the end of the second year, dental pathology, including a knowledge of gestation and diseases of women so far as they affect the mouth and throat, dental materia medica and therapeutics, oral surgery and surgical pathology, operative and mechanical dentistry. The examinations in operative and mechanical dentistry will include actual operations and the preparation of specimens of mechanical dentistry.

Every candidate must be twenty-one years of age, and of good moral character; he must give evidence of having studied medicine or dentistry three full years; he must have spent at least one continuous year at this school, have presented a satisfactory thesis and have passed all the required examinations.

The University Degree, D.M.D. (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfil the requirements.

Students may be admitted to advanced standing upon passing a satisfactory examination in a majority of the studies already pursued by the class; but no student shall advance with his class or be admitted to advance standing until he has passed such examination.

The work in the operative and mechanical infirmaries will go on throughout the course, but no student shall be permitted to operate at the chair until he has by observation and practice on extracted teeth satisfied the Professor of his fitness.

The faculty recommend young men who propose to take the degree to spend the whole of the required term of three years of study in the school. But those who wish to spend but two of the three years in the school are earnestly advised to pass their first year of study, before entering, under the direction of a *competent* private instructor.

Unsurpassed facilities for operative and mechanical practice are furnished by the infirmary of the Massachusetts General Hospital which is open throughout the year.

F E E S.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is \$200; for the second year, \$150; for any subsequent year, \$50.

For further information address,

THOS. H. CHANDLER, Dean,

222 Tremont Street, Boston, Mass.

PHILADELPHIA DENTAL COLLEGE,

Nos. 108 and 110 N. Tenth Street, above Arch.

FOURTEENTH ANNUAL SESSION, '76-'77.



FACULTY.

J. H. McQUILLEN, M.D., D.D.S., Professor of Physiology.
 HARRISON ALLEN, M.D., Professor of Anatomy and Surgery.
 D. D. SMITH, D.D.S., Professor of Mechanical Dentistry and Metallurgy.
 S. B. HOWELL, M.D., Professor of Chemistry and Materia Medica.
 T. C. STELLWAGEN, M.D., D.D.S., Prof. of Dental Pathology and Op. Dentistry.
 EDWARD L. HEWITT, D.D.S., Demonstrator of Operative Dentistry.
 ALONZO BOICE, D.D.S., Demonstrator of Mechanical Dentistry.
 HENRY I. DORR, D.D.S., Demonstrator.

THE DISPENSARY and Laboratory open all the year.

Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June. *Fall Preliminary Lectures*, commencing Monday, September 4th, will continue daily until November. Like the Spring Course, their object will be to anticipate subjects presented during the Winter Session. *The Regular Winter Course* commences Monday, November 6th, and closes on the last day of February ensuing. Three hours of each day will be devoted to attendance upon lectures, which will be illustrated to the fullest extent by a large and valuable collection of Chemical and Philosophical apparatus, and Anatomical and Pathological specimens. Tickets for the Course, including the Demonstrators', \$100; Diploma, \$30; Matriculation (paid but once), \$5. For further particulars address

J. H. McQUILLEN, Dean, S. W. Cor. 21st and Arch Sts.

T H E
MISSOURI DENTAL JOURNAL,

HENRY S. CHASE, M. D., D. D. S., Editor.

VOLUME VIII.

The Publishers of the Journal, being desirous of extending its circulation to the fullest possible extent, will send specimen copies to any part of the world on receipt of the address of dentists wishing to examine it. Address

A. M. LESLIE & CO.,

319 North Fifth Street,

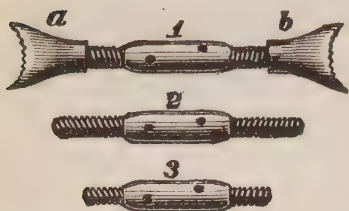
ST. LOUIS, MO.

DENTAL DEPOT.

Send for New Illustrated Catalogue.

JACK SCREWS.

Devised by Dr. C. S. LONGSTREET,
with Dr. A. McCOLLOM's Im-
proved Head.



This device is greatly prized by
those who have used it.

PRICES.

Full Set, as above, Nickel Plated,
screw and two extra bars...\$2.50
Jack Screw, Nickel Plated.....1.50
Bars, " " 50

Improved Triplex Rubber-Dam Punch.

Devised by Dr. F. W. DOLBEARE.

TWO STYLES, Nos. 1 and 2.



1st. It has in convenient
form for use three sizes of
punches.

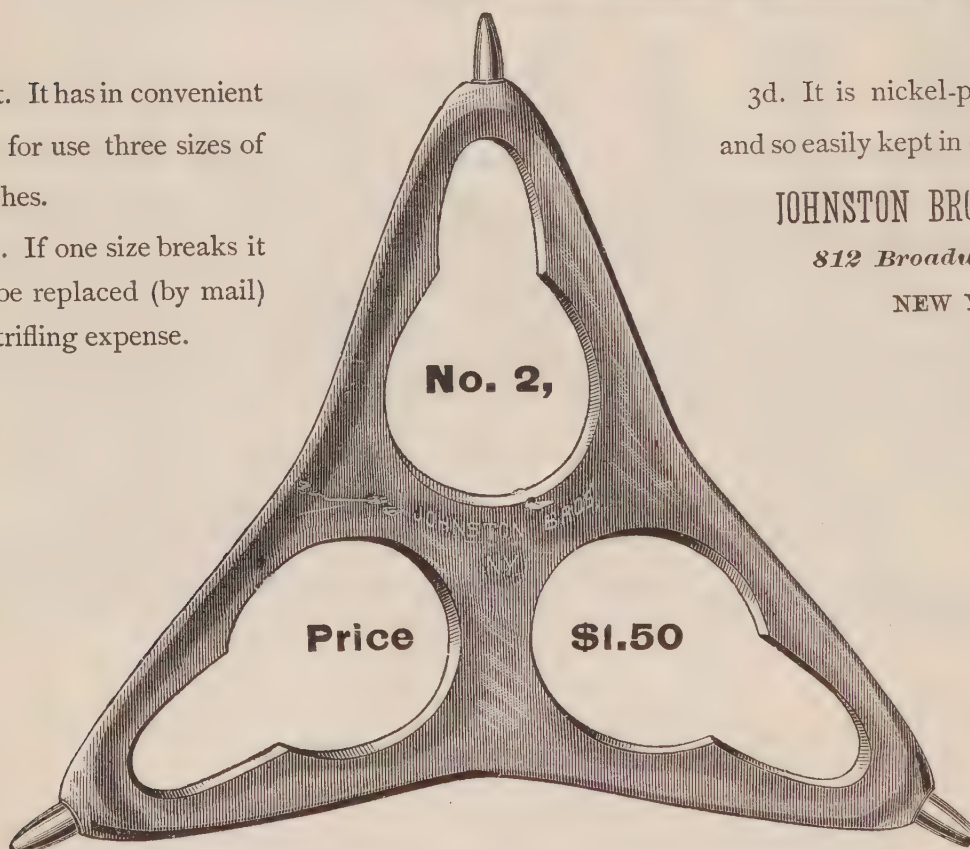
2d. If one size breaks it
can be replaced (by mail)
at a trifling expense.

3d. It is nickel-plated,
and so easily kept in order.

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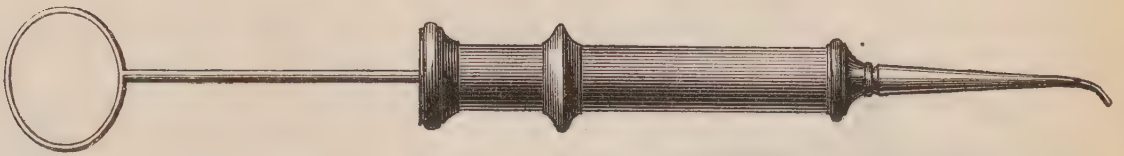
SECOND-HAND CHAIRS.

Dentists who have supplied themselves with the Morrison Chair, frequently request us to sell the chairs previously used by them. We therefore can ordinarily supply, at cheap rates, second-hand chairs of any of the varieties hitherto most used. For particulars, address

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SYRINGE.



This syringe, of metal, nickel-plated, is represented half-size. It is provided with a spring, a suggestion from Dr. A. H. Brockway, so that if after use it is placed in water its piston rises and it fills itself with water, and is so constantly ready for use.

The points, straight and curved, are removable at will.

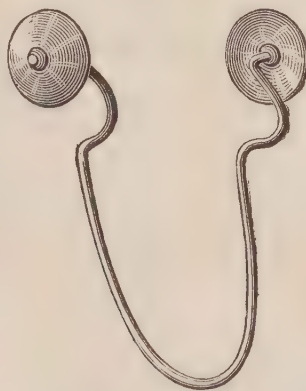
PRICES.

With one point, curved.....	\$2 25
With two points, one straight and one curved.	2 50

JOHNSTON BROTHERS,

812 Broadway, New York.

Elliott's Cheek Distender.



Cut is $\frac{1}{4}$ size.

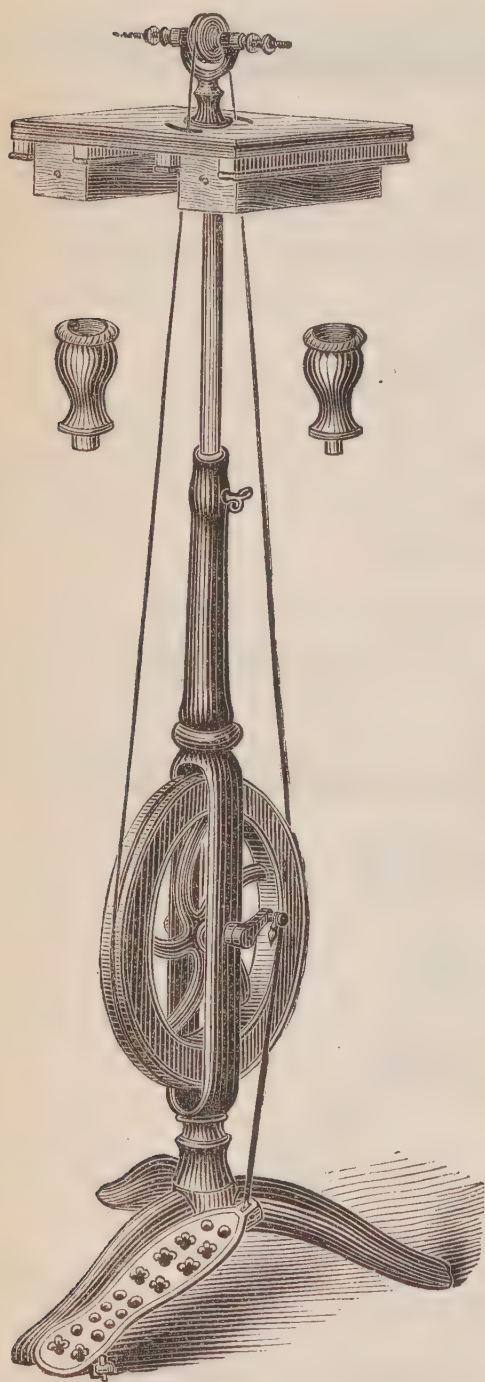
This convenient device, as its name implies, is designed to distend the cheeks of a patient during operations on the teeth.

Its bow of spring wire, and the cheek pieces are polished and nickel plated. It serves, in connection with its principal use, to reflect light on the teeth. As the spring is not stiff it is worn with very slight inconvenience. *This is proving extremely popular.* Price \$1.00.

JOHNSTON BROS.,

812 Broadway, N. Y.

American Lathe.



This cut represents an improved Lathe. It is made in the very best manner, and is suitable for either the *Office* or *Laboratory*. It has a solid spindle—one end of which is a taper screw for brush or felt wheels, and also a space for a large corundum wheel. The other side of the spindle has a space for a large corundum wheel and a screw to receive the chucks, on which very small corundum wheels can be placed.

It has a movable column and table, which is capable of being elevated ELEVEN inches, to accommodate the operator in either a sitting or standing posture.

Either end of the spindle can be thrown towards the operator, if more convenient, by the set screw at the top of the column.

Price of Lathe, with two Chucks, - - - \$18 00

“ Chucks, extra, - - - 15

 No charge for Boxing.

SNOWDEN & COWMAN,

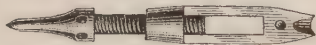
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For Sale by

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JACK SCREWS.--Old Style



LENGTH WHEN CLOSED.		LENGTH WHEN EXTENDED.	
No. 1.	_____	No. 1.	_____
No. 2.	_____	No. 2.	_____

While the Longstreet-McCullom Jack Screw, advertised on another page, is in constant and increasing demand, instances occur where the style of Jack Screw here represented is useful. We offer two sizes, having the length shown in the above cut. They are made of the best steel, and nickel plated. Price each.....\$1.25

JOHNSTON BROS.

PHENOL DENTIFRICE.

A very excellent Tooth Powder, devised by an eminent practitioner in New England.

Bottles, per dozen.....	\$3 00
Or Tin Cans, containing 1 pound.....	1 50
“ “ “ 4 pounds.....	5 00

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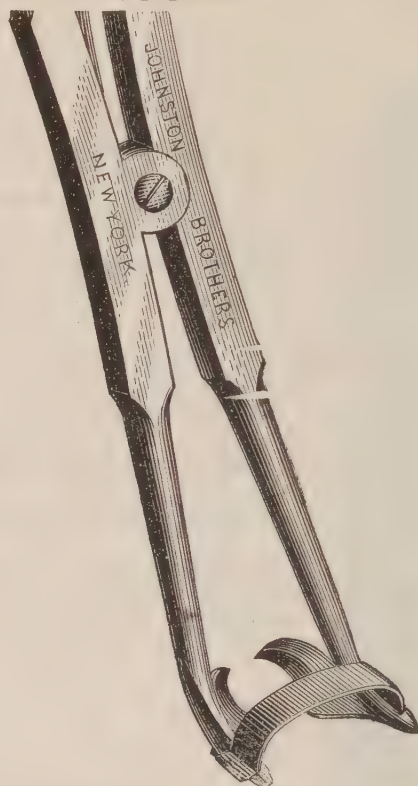
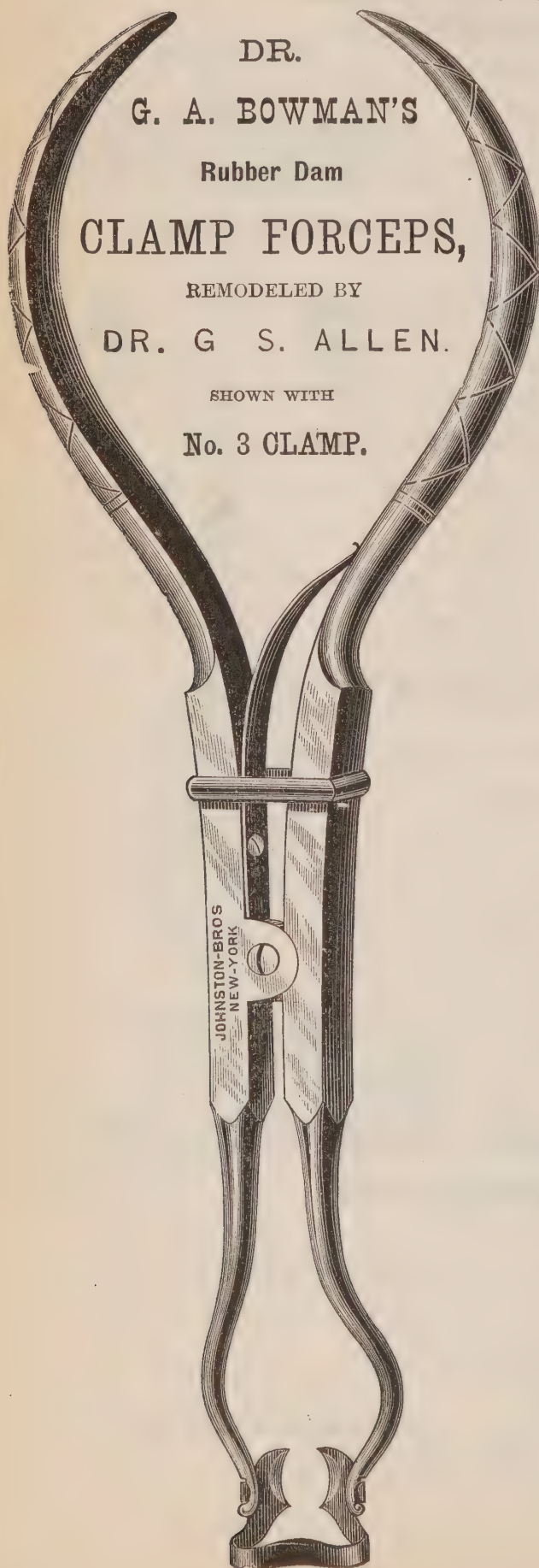
They are made of the size of cut, and with serrated points.

Price,	\$2 00
“ Nickel Plated.....	2 50

JOHNSTON BROS.

RUBBER DAM CLAMP FORCEPS.

Of these we offer two styles, both deservedly popular.



POINTS OF DR. T. C. ROYCE'S Rubber Dam Clamp Forceps,

Shown with Clamp. Handles are exactly like the other style, (Bowman's.)

Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

If so ordered we can supply either style of Forceps with a band, which will keep the Forceps and Clamp extended and ready for use when the hand of the operator is removed, as shown on the Bowman Forceps.

PRICES.

Forceps, either style	\$3.00
“ “ Nickel Plated....	3.50
Complete set of Clamps, embracing eight forms.....	4.00
Complete set of Clamps, embracing eight forms, plated.....	4.80
Clamps, each.....	50
“ plated.....	60

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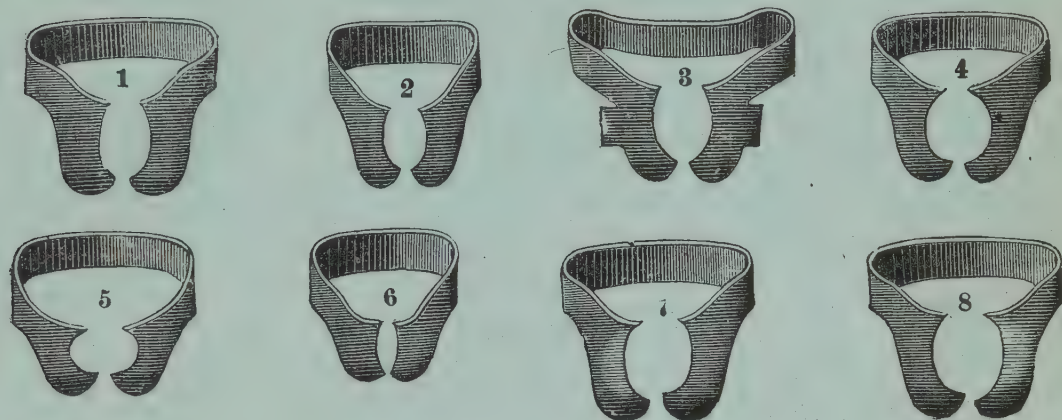
We were never more sure of doing signal service to the
Dental Profession than now in offering the

IMPROVED

Rubber Dam Clamps,

INVENTION OF

DR. DELOS PALMER, OF NEW YORK.



Price, set of Eight, { Oil finish, \$4.00. Each plain, 50 Cents
 { Nickel plated, 4.80. " Nickeled, 60

For use with Rubber Dam Clamp Forceps.

These Clamps are designed to be placed on the tooth at the commencement of the operation. Afterwards apply the Rubber Dam by passing it over both tooth and clamp.

DESCRIPTION.

Nos. 1 and 2.—Universal Clamp for Molars.

No. 3.—For posterior cavities in molars standing alone.

No. 4.—For third molars, or any molar of a cone shape. This Clamp can oftentimes be turned around while on the tooth, so as to place the bow of the Clamp out of the way of the operator.

No. 5.—For bicuspid.

No. 6.—For lateral and central incisors.

Nos. 7 and 8.—RIGHTS AND LEFTS.—For cavities under the gum, on the buccal or lingual surface of molars.

Cuts of two favorite styles of Rubber Dam Clamp Forceps will be found on another page.

These Clamps have prominent points of marked superiority over those of other manufacturers.

First. Each has been carefully adapted to the shape of the tooth for which it is designed, *under the personal supervision of Dr. Delos Palmer*, the inventor.

Second. A groove is made by us in the clamp, into which the forceps nicely fit, so that the clamps firmly hold their position on the forceps, when once adjusted, instead of tilting from one position to another—as is the case when no groove is provided.

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1877.

JOHNSTONS' DENTAL MISCELLANY

A MONTHLY JOURNAL

OF

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AND MECHANICAL LITERATURE.

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It will contain illustrated articles from Dr. NORMAN W. KINGSLEY, on the treatment of Cleft Palate, Deformities of the mouth, Regulating of Teeth, &c.

The commendation of the Miscellany, received during the last year, has gratified its publishers greatly. They purpose to make the volume for 1877 superior in all respects to either volume that has preceded it. This will be—

1st. Through more frequent contributions from the regular writers who have hitherto favored it, and by promised essays from equally capable practitioners, who have not as yet written for its pages.

2d. By the further reproduction of engravings upon dental subjects. Three such have already appeared, and others are in course of preparation.

3d. By the constant search for, and publication of, items of office practice, which serve to show the methods adopted by eminent and experienced dentists to overcome the little perplexities of every-day practice, and to shorten the operations in both laboratory and operating room.

4th. By the reproduction of matter of especial interest which may appear in Foreign or comparatively inaccessible publications.

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Vol. 3.

No. 36.

Johnstons'
Dental Miscellany,

A MONTHLY JOURNAL OF

*AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL
AND MECHANICAL LITERATURE.*

DECEMBER, 1876.

NEW YORK:
JOHNSTON BROTHERS,
812 BROADWAY.

JOHNSTON'S

DENTAL MISCELLANY,

FOR 1877.

It is certainly reasonable cause of self-congratulation on the part of the publishers of this Journal, that the end of the first year of its publication finds it with a large and constantly increasing list of subscribers, and that they are constantly in receipt of letters of encouragement and commendation from their readers in every section of the country, and even from distant portions of the world, one such letter being recently received from Japan.

We are promised one or more articles from each of the following gentlemen of established reputation, and others of like standing in the profession have encouraged the expectation of like favors from them.

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JOHNSTON BROTHERS,

812 BROADWAY, NEW YORK.

JOHNSTONS'

Dental Miscellany.

VOL. III.—*DECEMBER*, 1876.—No. 36.

GOOD JUDGMENT AN ESSENTIAL QUALIFICATION FOR THE DENTIST.

Read before the American Academy of Dental Science, at the Annual Meeting in Boston, Sept. 25th,
1876, by C. A. BRACKETT, D.M.D., Newport, R. I.

It has been well said that for the successful pursuit of the dentist's calling many and varied gifts are required. The different kinds of knowledge needed by one who aspires to practice the art in all its branches extend through wide fields. No earnest student, who has made sufficient progress in his studies to command a comprehensive view of them, will say that there is not enough in dental science to engage and profitably employ the ablest mind and the most indefatigable worker. The days when mere mechanical ability was thought to comprise all the qualification needed by the dentist are now, happily, long past. While no man can practice in any department of dentistry without manipulative skill, the fact is becoming each year more firmly established, that the best success cannot be attained unless that skill be guided by a thorough knowledge of fundamental facts and principles. In the light of these days the conscientious student will shrink from trying his hands upon living, sensitive tissues till his head has learned something of nature's laws. Most of these laws have a broad basis, and a knowledge of them can only be gained by comprehensive study. He, then, who would be an oral surgeon or a dental operator, will seek to know as much as he can command of the facts which scientific investigation has established. All structural peculiarities and all vital phenomena, from the inception of the embryo through all the stages of development, maintenance and

decadence, are not only proper but important and necessary subjects for his study and research.

In short, the canvassing of the whole field of what is generally understood to be comprehended by the term medical science, including especially, anatomy, physiology, pathology, chemistry, surgery, materia medica and therapeutics, as well as the study of strictly operative and mechanical dentistry, if not quite yet demanded of the dental practitioner, will doubtless be so in the near future.

Those who have had in charge the prescribing of the dental curriculum have appreciated this fact, and have been seeking to raise the standards as rapidly as such movement would be supported. In the mean time the faithful student in our schools has gone from them with a good degree of knowledge concerning the intelligent and honorable practice of his profession.

But the object of this paper is not at all to review the matter of dental education. It is prepared to make the statement, in some detail, that abstract knowledge alone, or with limited ability of application, is not enough for the highest success in practice, and that one of the most essential qualifications for the practitioner is a sound, discriminating judgment.

No one will dissent from the basal statement that it is, or should be, the prime object of every dentist to pursue that course in the treatment of every mouth placed unrestrictedly in his care which will preserve to its owner the best masticatory apparatus for the life-time, and this with the least interference, medical, operative or artificial, of any kind. The questions in the mind of every practitioner, as a new patient takes the chair, and he uses mirror and exploring instruments, should be something like these: What is the general state of this mouth? Is it one of health or disease, and how far dependent is the local condition upon systemic causes? Are the teeth regular in their positions and free from caries? Are their investments and the tissues of the mouth generally in a healthy condition? Are the mucous and salivary secretions normal? If abnormal, diseased conditions are present—what is their nature, to what are they due, and how can I best combat and cure them, and prevent their return? In what way can I render this person the best service?

Such general questions as these are only preliminary to innumerable others that present themselves as the treatment begins and the work is carried forward. At each step the practitioner finds himself called upon to decide between courses of procedure, means and methods, differing,

it may be, widely from each other, and to choose that or those which, under all the peculiar circumstances of that individual case, shall be the best.

Let me allude briefly to a few of the many classes of cases in which there is called for the exercise of careful judgment.

He who undertakes the care of a child's mouth assumes a momentous responsibility; and he must often be called upon to decide points which require the exercise of the most wise and skilled judgment. This is most emphatically true with the present generation in the cities of the Eastern section of our country. The limited, dwarfed, defective development of the general structure, and especially the osseous system, while the teeth retain very nearly the typical size; the conditions of hereditary transmission, including the mixing of families and races; the adventitious circumstances under which dentition is accomplished, render the prevention and correction of irregularities one of the most important branches of practice. With our boasted civilization it has come to be that few children accomplish either the first or second dentition normally—the teeth erupting at the right time, in the right order and position, and without undue disturbances, local or systemic.

It is for humanity a sad statement to make that nearly all children require, at some stage of dentition, some operative interference. What that interference shall be is sometimes one of the most perplexing subjects that the practitioner is called upon to consider. With reference to the second dentition it involves answers to such questions as these: In this case, by careful watching, by the preservation of the deciduous teeth in good condition to the limit of their allotted usefulness, by their judicious extraction at exactly the right time, by the following on the part of the child in all respects that course of life which tends to the best physical development, by simple means of guidance, such as the patient, nurse or parents may employ, is it possible to bring all of the permanent teeth into their proper positions, and insure that regularity of the whole which is such an element of beauty and attractiveness in the human face? Is the development or want of development of the jaws such, or will it be such, that a disproportion to the size of the teeth will lead to complications requiring more decided action, as the wearing of mechanical appliances for the prevention of irregularity, or its correction after it becomes established? Shall I interfere now, or are there advantages to be gained by delay, and if so, what are the advantages? Of the mechanical means that may be employed, which are the best adapted? Which will accomplish the desired object the most readily and speedily, with the

least embarrassment, annoyance and pain on the part of the patient? Again, in the effort to obtain regularity, is it wise to attempt the preservation of all the teeth, or are the positions and proportions such that an even standing cannot be satisfactorily attained; or if attained, is the texture of some or all of them such, that the comfortable and serviceable preservation of the whole cannot be hopefully attempted? If teeth are to be sacrificed which are the ones, and why should they, instead of others, be made the unfortunate victims of the ruthless forceps? When the decision is made that certain teeth must be removed, the question comes, At what time should the extraction be made that the jaws should attain their best development, and the remaining teeth acquire the most advantage of space and occupy it in perpendicular positions?

If the young dentist seeks assistance from more experienced practitioners in answering these questions, he will find that on many points honest differences of opinion exist; he will have different plans detailed, and with all the aid he can obtain, the case requires the exercise of the wisest and best personal judgment that he can bring to bear upon it. Even if there were such an agreement of opinion concerning theoretical cases as to substantially establish laws of practice for different classes, the young man would often find difficulty in assigning a case to its proper class, and the planning of the best course to be pursued.

The course decided upon, each step of the work calls for the exercise of judgment. In moving teeth it is important that the motion be at such a rate as not to produce unnecessary pain or involve danger by its rapidity, or needlessly try the patience and confidence of the victim and tax the time of the operator by its slowness. The movement accomplished, judgment must decide in regard to the need of retaining appliances, and, if required, for what length of time, in order to insure that permanency of result which alone can be satisfactory to all parties concerned.

In all operative practice the personal judgment of the dentist must be constantly exercised. The work of filling teeth is peculiar. It is not like many other callings, in which a rule made for one case answers for all, and whose pursuit is a mere routine. In the practice of a life-time we never find two mouths just alike, and hardly two cavities in which all conditions are precisely the same. No single line of practice can be best adapted to all cases, and he who would render the most valuable services must have all means and methods at his command, be truly eclectic, and—in a good sense—"all things to all men."

The patient's age, sex, occupation, state of general health, the local

health of the mouth, the character of the oral secretions, the position of the teeth in relation to each other, their original constitution, present texture and probability of change, either by deterioration or by acquiring increased hardness and strength, the consequences of accidents, etc., etc., are some of the many circumstances that make up that diversity of cases which requires a quick eye, an educated mind and active brain for their detection, and the exercise of sound judgment in the planning of the best course to be pursued in operating.

Not one of the least important things to be decided is the way of obtaining access to proximal cavities. Shall it be by forcing the teeth apart or by cutting from their contiguous sides? If some form of wedging be the choice, shall it be done slowly or quickly; with tape, with cotton, with rubber, with wood? If a portion of tooth substance is to be sacrificed, shall its removal be accomplished with the file, the chisel or the disk? Shall there be a combination of both methods of gaining space, and will the space so gained be such as to enable the operator to thoroughly prepare the cavity and pack the filling; or is it advisable, for certainty of accomplishment or from the frailty of the wall, to cut through from the coronal or buccal surface, and which shall it be? Are the circumstances of the case such that it is desirable to retain the space permanently, and shall the fillings be made with that view, or shall the contour of the tooth be fully restored?

The preparation of the cavity for the reception and retention of the filling, the securing of proper anchorages without endangering the pulp, and with an avoidance of weak walls, the maintenance in frail teeth of the best possible balance of strength between the filling and its support, call for such an exercise of careful judgment that we may say, in classic parlance, "Show me the way in which you prepare a cavity, and I will tell what kind of a dentist you are."

The choice of filling materials requires less skill, perhaps, but there are many circumstances under which a little thought may be profitably bestowed upon this apparently easily decided point. A filled tooth, considered with reference to its durable integrity, is not stronger than its own weakest part or the most vulnerable peculiarity of the filling material. The list of filling materials at present in ordinary use is so limited that their respective strong and weak points are speedily passed in review, and their fitness for any case readily determined. Cases often occur in which the comfortable preservation of a tooth may be more effectually accomplished with a combination of two or more materials than with one. For illustration, at the cervical part of cavities extend-

ing much beyond the level of the gum, where no friction can come, and where it is possible to maintain dryness only momentarily, Hill's stopping, or gutta-percha, from its ready, quick and perfect adaptation and its resistance to solution in any fluids that can come in contact with it, possesses elements of much permanency; for the portion of the filling exposed to wear gold may possess equal resistance; and so the two together, each in its place, are much better than either could be made alone. With all the variety of circumstances, it is easily seen that in operative dentistry there is room for the exercise of judgment even in the choice of materials.

In the mechanical department a similar statement holds true, and all the skill of the most consummate artist is not too much to be exercised in the fashioning of those materials into a denture that shall comfortably subserve the purposes of mastication and speech, and maintain or restore, as far as may be, the natural outlines and expression of the human face divine. It must be confessed that on some of these points there still lingers about the profession a lack of judgment, as well as of taste and skill.

Highly educated judgment is especially required in all surgical and therapeutical practice. You may say that it is knowledge that recognizes and precisely defines pathological conditions. Yes; but good judgment must have much to do in determining the means and manner of treatment, and in carrying forward the steps of that treatment in the best order, at the most favorable time, to the happiest conclusion.

Our manner requires consideration, particularly towards patients under trying circumstances, as those which call for sacrifices or the endurance of great pain. It is sometimes necessary to use very strong influences to bring patients to submit to extractions that must be accomplished if our carefully considered plans are to be carried out. Different individuals are differently constituted, and the persuasive means that would be successful with one patient would have to be substituted with entirely different ones with another. The operator should be quick to detect these peculiarities, and let his action, whether coaxing or commanding, quickly executing or patiently waiting, be such as will best accomplish the object and leave the least unpleasant impression upon the victim.

In the practice that comes to some of us, there are cases in which pecuniary circumstances must have their influence upon the making up of the plan to be pursued. This is to be regretted, and it makes the exercise of careful judgment and consideration all the more important, and the carrying out of that judgment more difficult.

What I have said is only suggestive of the indefinite length to which the subject might be pursued. Further consideration now would not be profitable, but if what I have said leads one young man to take a broader view of his work and to put just a little more thought into his operations, the valuable time you have spent in so kindly listening to me will not have been wholly squandered.

It is now more than three years ago that one dentist said to me of another, "He is a man of good judgment in his operations." I did not instantly comprehend the full meaning of the words, but I have often thought of them since, and have come to realize something of the high praise which they express. For those of us who are young men with only the rudiments learned, I feel that it is an invaluable privilege to have the instruction and counsel of the older and honored members of this society; and I am sure that those who have been cognizant of their practice will testify that much of their success has been due to their good, sound *judgment*.

AMERICAN DENTAL ASSOCIATION—MEETING OF AUGUST, 1876.

SECOND DAY, Aug. 3d.

A second paper on Operative Dentistry was read by Dr. A. W. Harlan, of Chicago.

The Committee on Voluntary Essays reported that papers had been presented by Dr. Taft on "The Transplanting and Replanting of Teeth," and by Dr. Morrison on the same subject, with cases.

Dr. Morrison's paper, which was presented through Dr. Shepard, recited a considerable number of cases in which teeth had been removed from the mouth of the patient, filled or otherwise operated upon, and returned to their position with the happiest results, in one case twenty-six hours having elapsed between the extraction and replacement of the tooth.

Prof. Taft then read a paper on the same subject, which gave a review of what had been accomplished in the transplanting and replanting of teeth. The paper was quite lengthy, abounded in instructive information.

Dr. James Leslie, of Cincinnati, in speaking of the use of gold fillings, asserted that he was the real inventor of cohesive gold, in 1839,

the first operation being performed at his suggestion by Dr. H. L. Klutt, of Louisville, Ky.

He believed that one of the reasons to be ascribed to failures in gold filling was the use of the mallet. The principle of cohesion is impaired by the continued and repeated effects of malleting, causing a hardening of the gold, and a consequent disintegration. He explained that a gold pellet or a leaf compressed and beaten into the cavity is only condensed by the driving out of the atmosphere from the interstices of the metal, and when the atoms are beaten together closer than the point where they are in contact, with the air entirely expelled, disintegration is certain to take place.

Drs. W. H. Allen and Kingsbury both agreed with what Dr. Leslie had said concerning the tendency to do too much malleting. Dr. Barker stated that it had been claimed that filmal resistance could not be overcome by gradual pressure, but only by shocks. He desired to know if this was a true theory, and if it was, he was going to retain the electric mallet. As to its use, he thought that all efficient dentists knew where the limitations in its employment were.

Dr. Wetherbee contended that cohesive foil can be completely and readily adapted to the walls of all cavities. He believed that the use of the mallet was likely to bruise the dentine.

Dr. Shepard explained by black-board diagrams the philosophy of cohesion and non-cohesion in gold, showing why cohesive gold in rope form was unsuccessful in certain hands.

Dr. Flagg said that he had met with success in the use of layers of adhesive foil in many cavities, and he agreed with Dr. Wetherbee with regard to the dangers of the mallet.

Dr. Morgan, in speaking on this subject, said that in his investigation he had discovered that as far back as there is record of the use of gold, it has always been employed in the same identical forms in which it is now used.

Dr. Stellwagen said that what makes dentistry a profession is the power to judge where it is advisable to employ cohesive and where it is best to employ non-cohesive gold. Neither form could be used exclusively in general practice, but the specific usefulness of both ought to be universally recognized.

Dr. Hunt said that it was recognized that fillings of both kinds of foil were often successful, but what ought to be learned by the profession is the exact action of the gold in its adhesion in the tooth. Hydraulic pressure can be made to burst the strongest vessel; lead poured into an

iron cup and hammered, the cup will burst; what, then, will be the effect of malleting upon gold placed in the cavity of a tooth?

Dr. Barker said that the usefulness of cohesive and non-cohesive gold depended not so much upon the superior qualities of the one or the other, as it does upon the skill of the operator. Thus it was a mistake for those who were less skillful to attribute their inability to perform a successful operation to defects in the form of gold which they employ, while the true causes lie in their own incompetence. He had often carefully examined both cohesive and non-cohesive gold by microscopic analysis, and had never been able to detect the difference.

At 1 P. M. the meeting adjourned until 2.30 P. M., when, upon re-assembling, Dr. Barker continued his explanation of a means of treatment in replantation that had been interrupted.

Dr. Stellwagen exhibited a rooster, in the comb of which had been transplanted a bicuspid. In relation to the permanency of transplantation, he said that he believed there were instances of teeth lasting nineteen or twenty years. He spoke particularly of the necessity for extreme caution in the selection of such teeth for transplantation as will not transfer any hereditary diseases.

Dr. Taft recommended the transplantation in many cases of alveolar abscesses where there is chronic inflammation of the tissue around the tooth resisting all ordinary means to restore a healthy condition. He had employed the treatment in such cases himself, taking out the tooth, cleansing the socket of all débris and replacing the tooth again. It was best applicable, he thought, to teeth of a single root. In cases of neuralgia it was also recommended as a useful process. Care in every case should be taken with the transplanted tooth that it may be kept in a perfect condition; antiseptics should be used to prevent decomposition, and the patient should be placed in a nutritive condition of system and protected from the many outside influences.

Dr. Atkinson briefly considered the sympathetic energy necessary to cause the transplanted tooth to unite with the tissues of the gum. He contended that it was an assumption for any dentist to talk about influencing constitutional conditions so as to produce consequences necessary to cause the union.

Dr. Palmer, in speaking of a new method for the preparation of gold foil, said that it should be cut into sheets, and placed in the books by the beater without the preliminary heating, the operator using it just as it comes from the beater, doing the heating himself before placing it in the cavity. The repeated heating of the foil by the beater reduces the cohesive qualities of the metal.

Dr. Buckingham, from the committee appointed to prepare suitable action on the death of Professor Wildman, submitted a series of resolutions eulogistic to the character of the deceased, which were adopted, after remarks by Dr. Buckingham concerning Dr. Wildman's valuable labors in the profession.

The Association then adjourned until evening.

A PHYSIOLOGICAL DENTO-PATHOLOGICAL QUESTION FOR THE DENTAL FACULTY.

By A. C. CASTLE, M.D., New York.

THE DENTAL MISCELLANY, Vol. 3, No. 34, p. 386, Oct., 1876, publishes what purports to be a proposition (from the pen of Mr. F. H. Balkwill) of Mr. Charles Tomes: "Does comparative physiology teach us that the tooth pulp performs no function towards the vital permanence of the human tooth?" Predicated upon the quotation Mr. Balkwill furnishes, to wit: At the February meeting of the Odontological Society Mr. Charles Tomes is reported to have said: "It is not known what the purpose of the pulp was" (is) "in a finished tooth, nor why the tooth should not do just as well without it. As a matter of fact, there were a good many teeth in other animals which did just as well without pulps, and which lasted sufficiently for the animal's requirements during its lifetime. There were certain teeth in lizards in which there was no central living pulps, yet they were not rejected as dead things to be thrown off. Until more was" (is) "known as to the use of the pulp in a perfect tooth, it need not influence their" (the dentists') "practice."

The difference of plan found in every organized, living sentient being places man first, as possessing the highest "finished" or rather "perfect" organization, compared with the extreme of the low scale the lizard holds in the animal kingdom. I need hardly quote: "There is one kind of flesh of men, another flesh of beasts, another of birds, another of fishes" (and I may add another of *reptiles*), and that by comparative anatomy and the peculiar physiology and variety of pathological difference with their laws of action and results, each is affected, forming the character of the several organizations down to the "meanest" of animal vitality. They unite in exhibiting the logical fact, that each particular nervous system, and each particular nerve thereof, bone, perios-

teum, muscle, gland, fibre and other tissues, individually and comprehensively have and apply their uses and their intention to each and every function affecting every atom of the peculiar economy of the nature of each after its kind.

I believe that a great injustice would be done to the fame gained by Mr. Tomes were we to entertain for a moment that a gentleman of his erudition, careful research and originality of thought could by any possibility have given utterance to the above construction of language credited to him. I feel certain that the gentleman has been either totally misapprehended or absolutely misrepresented. By a similar mode of reasoning the proposition might be adduced that because a dog's spleen, by vivisection, was removed without any apparent injury to the vital functions, and that the mutilated animal may live and fatten—as was the case of the dog deprived of its spleen—it does not prove that some other of the functions were *not* interfered with, the animal not possessing the faculty of observing and explaining symptoms affecting its natural comfort consequent upon the abnormal and altered condition of physiological order in its system; nor does it show the time the animal's existence was shortened, nor the time it can be prolonged by the extirpation of its spleen. This important fact does not appear to be ascertained by experiment, *à priori*, then, upon the physiological adaptation of the lizard's dentition of "certain teeth" (which) hypothetical evidence is reported as a *proposition* that "finished" or "*perfect* teeth" in man "can do just as well without nerve-pulps as those of the lizard can, and a good many teeth *in other animals* which did just as well without pulps." So *a fortiori* the diminished physiology of the dog has had the honor of being placed in juxtaposition with the physiology of man. Comparative dental anatomists and physiologists and vivisectionists prove, to their own satisfaction, that the spleen in the dog is useless, and hence man can do just as well without a spleen, and that his "perfect teeth" can do just as well without nerve-pulps because teeth in "*certain*" lizards are assumed to do so!

Every advance in knowledge diminishes the number of errors. There is hardly a period passes that does not, in the work of nature, bring some operation, or some mode of operation to light, which was before undiscovered, and in many instances unsuspected. Investigation has demonstrated that the spleen not only has important functions, but also that it performs them to the advantage of the animal economy, as investigation proves that important functions of nerve-pulps are performed in "finished" and "perfect human teeth," *with physiological intent to preserve them to the animal economy.*

If Mr. Tomes ever did utter the concluding sentence of the quoted paragraph, "Until more was" (is) "known as to the use of the pulp in perfect teeth it need not influence their" (the dentists') "practice," I will demonstrate to the dental profession that the gentleman is in error. First, of necessity, quoting the physiological functions of the vascular dental nerve-pulps in the dental system of man (leaving "certain teeth in lizards" and "other animals," their "food and habits," to the care of the physiology adapted to each of their kind), and then by illustrating the physiologico-pathological condition of "*finished perfect teeth*," with an interesting case of acute *dento-neuralgia* (one of the thousands of cases presenting themselves to, and often perplexing, the skill of the medical and dental faculty) which occupied the attention of three dental practitioners, one family physician and divers apothecaries.

I proceed with my data based upon forty-five years' attention to this subject. Thirty years ago, in the *Boston Medical and Surgical Journal*, in the *London Lancet* and in several dental periodicals I published my views and endeavored to attract the attention of the medical faculty and the members of the dental profession to the importance of the subject.

Let us dwell for a moment on the formation of the teeth. Upon raising the shell of bone forming the outer layer of the bone-substance of the tooth, a soft, vascular pulp is found to have been the *mould* on which this outer layer of ossific matter has been formed. This pulp or vascular papilla has not only the peculiar property of secreting and depositing bone substance, but as the origin or expanding point where it forms the rudiments of the bicuspid and molars its base divides so far as to form the mould of the two, three and four fangs. Around these divisions of the pulp the ossific matter is deposited so as to form tubes continued downwards from the body of the tooth; by successive layers of bone deposit on the inside of these tubes, they become strong roots or fangs, and the deposited bone has so encroached on the pulp that only a small chamber in the crowns of the teeth and a narrow canal for the connecting nerve remains. The vascular pulp is altered, having shrunk into this narrowed space. To the too rapid deposit of bone, *abnormally* infringing upon the dental nerves, may truly be attributed the exciting cause of convulsions, etc., so fatally affecting teething children.

The tooth forming upon this nervo-vascular mould is surrounded with a membrane, giving to the whole the appearance of a little sac. It has its important uses. Like the pulp it is full of blood vessels, but it is more connected with the gums and receives its vessels from the surface, while the pulp within the tooth receives its blood vessels from the

branch of the internal maxillary artery which enters and takes its course in the jaw. This nervo-membrane sac being pierced by the erupting tooth *retains its connection with the tooth and gum*, forming an investing *highly* sensitive membrane embracing the neck and fangs of the tooth, and extending itself by its own reflexion forms the lining membrane to the tooth socket or *alveolus*, and joins the periosteum of the maxillary bone. I need hardly add that it is of vital importance to the medico-surgeon-dentist never to lose sight of, but always to bear in mind this peculiarity in the dental nerve system.

Because of the physiological condition of "certain teeth" in the lizard ("and other animals,") almost the lowest grade in the animal kingdom, shall crude speculation select them to base an assumption upon, while the teeth of the *rodentia* constantly being worn away by attrition are as constantly *renewed* by the growth of the tooth by the formation of ossific matter proceeding from the pulp pushing it forward? Musket balls have been found in the tusks and teeth of elephants, and bone matter has been deposited around and enclosing them, giving proof of the local excitement of the parts, healthy inflammatory action, and consequent deposit of ossific matter, demonstrating the physiological and pathological use of the vascular pulp, many specimens of which are in the collections made by Haller, Monro, Bell, Blumenbach, and others.

Will speculative erudition, then, justify the anatomist and the pathologist's ignoring the physiological intention and importance of the fifth pair of nerves—the grand sensitive and motor nerve, whose branches are distributed and ramify through the bones of the head, muscles of the face, to the eye, nose, mouth, palate, fauces, tongue, jaws and teeth, &c.? Are the thirty-two branches, and their extra twigs furnished to the bicuspid and molars, given off from the second and third main branches of the trigeminus and supplied with a vascular system of arteries, veins, &c., to remain useless, inactive, inert, or in a state of latent paralysis, as it were, in "perfect," "finished teeth," with blood vessels reaching them as nearly direct from the heart as the nerve is supplied them direct from the brain? Enduring, perfect teeth are found only in those persons of well organized system, of first class constitution and perfect habits of body with constant, vigorous health. To the plain mechanical dentist, whose *indefinite* medico-physiological and pathological knowledge does not extend beyond the mechanism of artificial teeth, or filling a tooth with gold, the demonstrated fact falls even within his perception. *Causa latet vis est notissima*, to him, the cause is hid, but

the effect is known. The proof of the fallacy that "perfect teeth do just as well without pulps," daily presents itself to the notice of the dental practitioner. It is *only* in this class of *perfect* teeth, *the dense adamantine, hard, yellow teeth*, that the nerve-pulp performs its function of *re-producing osteo-dentine* to the tooth, the bone and enamel, which has been worn away by attrition, &c. In the softer teeth, especially in the fishy, pearl-like gelatinous teeth of the cachectic diathesis, it would appear that the nervo-investing peri-dental membrane (*dental periosteum*) of the fang does this office, by depositing *genuine* ossific matter on their external surface, either in the form of hypertrophy or exostosis, a physiological instinctive effort, as it were, to strengthen or replace a decayed or weakly constructed organization: while, in the perfect, yellow teeth, the intro-dental system secretes a semi-transparent amber-like dentine which penetrates into the *tubuli* of the bone substance of the tooth. In all the forms of abraded surfaces, or wasting of the tooth by attrition, &c., we observe the vital principle and dento-ossific resources derived from this intro-dental, nervo-vascular resource: and here we have the demonstrated proof of the provision, the physiological effort and intention of preserving and retaining the teeth to the animal system. To wit: That as the nerve-pulp, arteries, veins and membrane, *pari passu*, recede with the wearing down of the crowns of the teeth, they secrete and deposit osteo-dentine, first to protect themselves from exposure and by the same effort to replace the loss to the tooth. The nerve-pulp is ultimately obliterated and the dentine occupies its place, which, if not so hard, dense and strong, nor so resisting as enamel, or the bone it would save, possesses sufficient impenetrability to preserve the tooth for a long time, often to the end of life. And remarkable it is that while this vital effort and principle is in progress for the reproduction of bone to replace the loss, and which caused the shrinking of the pulp, &c., during the *formation* of the teeth in infancy, here again in age it gradually infringes upon and finally fills up the pulp chambers and nerve canal, obliterating them from the dental organs altogether. (The rapid process of which in very many instances, by pressing upon the pulp, produces intense neuralgic suffering, with sympathetic symptoms in advanced life, as "irritation," convulsions, pyrexia, &c., affects children "teething.")

This process often occupying years being completed,* the *internal*

* Procure the jaw of a young calf, and one of an old bovine, clean the teeth from them. Leave them to a dry heat for several days—110 degrees Fah. The hollow fang and its contents will illustrate the bone formation of bone in the beginning; and splitting the bovine's tooth will demonstrate the new moulded dentine in its ending of its destiny. Human teeth may be treated and demonstrated in the same manner.

tooth is forever after freed from irritation and pain; but other complications present themselves, *sensibility* and the whole action of nutrition are thrown upon, or transferred to the nervo-peridental membrane investing the roots or fangs producing swellings, induration, inflammatory affections, abscess "gum-boils," abscess, heat, pain, and neuralgic paroxysms.

In those cases where the intro-dental pulp is subacutely chronically affected, the patient is distressed with sensitive painful teeth, the mere touch of the finger nail, or tooth brush, certain food, confectionery, etc., to the necks or fangs of those organs causes thrilling uneasiness and pain. The existence of this pathological condition of the dental pulp and its sympathizing nervo-peridental membrane with the secreted deposit of osteo-dentine filling the dental chambers and results, (including the entire absorption or wasting of the gums, causing the teeth to fall from the jaws), is not only demonstrated in the human dental system, but also in the teeth of gramnivoracious animals. Many valuable horses are rendered useless because of the too rapid wearing down of the teeth, not allowing sufficient time for the deposit of dentine for the protection of the nerve-pulp. Irritation and acute pain are the results, and sufficient and proper food cannot be eaten to supply nutrition. Aged cows, oxen and swill-fed cows, (and doubtless, "other animals"), suffer from the same cause.

The following case will fully illustrate this paper. It refutes the quotation of the doings of the English Odontological Society. The subject cannot fail to interest and impress every member of the dental profession. The pathology and important pathognomonic, symptomatic and sympathetic relation and influence of the *dental system* on the nervous system generally, my limited space will not allow me to enlarge upon.

CASE.—Mr. A——n, a gentleman whose appearance represents his age to be between 65 and 70 years, presenting a robust fully nourished physique, well developed organization, hale functional constitution, and hence vigorous good health, smooth skin, fresh brown complexion, clear eye of quick expression, and of nervous-bilious (excitable) temperament. The organization of his dental organs presents the dense, hard, solid yellow "*perfect teeth*" I speak of—and here they are shown, all in unison of color and in *good condition*, with the exception of the masticating surface being denuded of the enamel, removed by attrition. To avoid reiteration, they exhibit the pathological state and physiological change of being preserved to the animal econ-

omy, as I have described in this paper. The crowns of the teeth were insensible to the touch, *i. e.*, painless; but between the second molar and the wisdom tooth on the right upper maxilla the *gum* had receded, leaving their approximate fangs and the intervening alveolus entirely denuded and exposed—a serious and perplexing complication. Otherwise the gums were hard and healthy. This was the condition of the mouth and teeth. The patient complained of acute neuralgia “all over and throughout the upper jaw and face.” His pulse was full and bounding, skin hot and dry, breath feverish, in short, a general febrile condition attended with nervous excitement. The only external symptom was acute pain in the *exposed neck* and *fang* of the central molar tooth upon being touched by a metallic or an *ivory* probe. “Ah—that’s the spot!” the patient almost screamed when I touched the fang; thus demonstrating my diagnosis that the intro-dental pulp and nerve was in a state of congestion and inflammation affecting the dental bone and the external *peri-dental* portion of the membrane left attached to the fang and neck of the tooth.

Perceiving his excitable temperament, I suggested for his decision, one of three plans of cure. “The most speedy and certain (as in his case) where the fangs and alveolus were left denuded, was extracting the tooth, by which removal the gum would surely close over the exposed dental and maxillar bone, and exclude the external cause—atmospheric pressure and other irritating agents. Second, by drilling into the pulp cavity and ‘destroying the nerve;’ and the last, which I preferred, although the most tedious, was medical treatment—if he had *patience* to submit to it.” “Do as you think proper, I place myself in your hands,” was the reply. My preliminary treatment was freely to scarify the inner surface of the receding gum, separated from the fang and neck of the tooth; hoping by such irritations—in connection with the other application—to produce reaction and reparative granulations of the part to fill up the break in the gum tissue. I applied two leeches with the intention of relieving the congested blood vessels oppressing the intro-dental pulp and nerve, and those also of the external nervo-peridental membrane, as well, thereby, of reproducing a health-circulating blood, affording the necessary nutrition to the part. I prescribed a searching, powerful, stimulating, as well as sedative, constringing application (whether he used it or not, I do not know), hoping to retard, to a certain extent, the circulation of the blood vessels of the pulp, until their *normal* action was re-established. I applied a leech to the opposite right side of the jaw, where the central molar tooth had been extracted,

for the purpose of relieving the pain, and where the neuralgia *was first experienced and still continued*. I applied counter-irritants behind the ears, and prescribed nervo-tonic pills to be taken at bed-time every night—whether he did so, I do not know. He promised to see me again the following morning ; he did not do so.

Some four weeks after the gentleman did me the honor of presenting himself, when he gave me the history of his case as follows : “ Previous to my being introduced to you,” which he had already informed me, “ I was distractedly mad with pain in my left upper jaw, tooth and face ; all the pain seemed to come from the molar tooth. I called upon my family dentist ; he looked at my teeth and said they were in excellent condition ; he gave me washes for my mouth with no good results ; I went to several apothecaries, and they gave me spirits of camphor and opium—while I applied them they relieved me, when I stopped the pain returned. At last I insisted upon having the tooth out, and my family dentist extracted it ; then all the pain went over to the other side—the *right* side—into the corresponding right tooth ; and the pain was in *both* sides, and extended all over my face and jaws, when I was introduced to you ; what you did afforded me very little relief, although the leech bites bled copiously two or three hours. So, the next morning, in place of coming to you, I called upon my family physician, and told him my trouble. ‘ Oh, is that all ? ’ he said, ‘ I’ll soon cure all that,’ and he gave me a prescription. I procured the medicine and took it, two good nights’ rest followed, but the morning following all the pain returned. I called upon him again, when he told me to go and see Dr. ——. I did so—he examined my mouth, and he said, ‘ All the pain was caused by a *dead* nerve in this,’ pointing to the right central superior molar tooth, and he said, ‘ My family dentist had done very wrong extracting the tooth on the other side.’ I here interrupted him with the question, ‘ Did you inform the doctor that the pain *originated* in that tooth, was concentrated there, and thence diffused itself to and over the left side of your jaw and face only ? ’ He replied, ‘ Oh, yes, I told him all that.’ ‘ Well ? ’ I rejoined. ‘ Well,’ he continued, ‘ the doctor then drilled a hole into my tooth,’ (in the centre of the masticating surface, about a quarter of an inch through the dense crown,) ‘ and broke off a large piece of my tooth doing it, but that’s of no consequence ; and after drilling some time, suddenly—my—I thought my head was off. I exclaimed aloud. ‘ All right, I’ve got it,’ he said, and he showed me the black dead nerve covered with blood, and the black dead bone that he took out of my tooth, and all the pain was gone. ‘ Now, doctor, tell me how much I am indebted to you for what you did ? ’ ”

Mr. F. H. Balkwill, through the DENTAL MISCELLANY, has furnished the views of the English "Odontological Society" (as emanating from Mr. Charles Tomes), upon an assumed physiological and pathological uselessness of the dental pulp "in perfect teeth." I deem it pertinent to the philosophy of dental science, and due to the dental practitioner, herewith to furnish the New York Odontological Society and American Dental Association with a key-note to the gamut of physiological and pathological variations displayed in perfectly organized dental organs exhibiting the functions of development, refuting the supposition that—"until more is known as to the use of the pulp in a perfect tooth, it need not influence their practice."

I would also offer the following pathological questions, as being worthy of the attention of the above-mentioned associations, in the case above quoted, bearing upon dental practice in medico-dental surgery. First—What was the pathological condition of the dental organs of Mr. A——n when he applied to his family dentist for treatment? Second—To what extent of irritation did the receding gum, exposing the neck and fangs of the tooth and the alveolus, affect—if it did do so—the interdental pulp and nerve of the tooth extracted and that of the other drilled into? Third—What was the pathological condition of the whole dental system, that the removal of the *original* paining tooth, affecting the *left side* of the jaw and face, was followed by a *metastasis* to the corresponding tooth on the *right side*, with acute neuralgia over the entire region of the jaw, when dento-neuralgic pain rarely, if ever, extends beyond the *mesial* line demarking the side affected? Fourth—Why should extracting an offending tooth, causing acute neuralgia, with *pyrexia*, etc., be "*very wrong*," *i. e.*, bad practice, because the diagnosis and operation failed to remove the symptoms; and (apart from an intent to retain the tooth), is *drilling into* or *through* a tooth, for the purpose of extracting a "*dead nerve*," or *destroying a living one*, more "*very*" right, and more certain of success, than by removing the tooth from the jaw, and leaving the other tooth *in situ*? Fifth—In which, the *left* tooth, wherein the pain existed *first*, or in the *right* molar, tooth (affected after the first had been extracted), was the remote cause defined, or the proximate cause demonstrated by the pathognomonic and sympathetic paroxysms?

Case 2. Miss C——s, of this city, a lady about 35 years old, whose organization and constitutional excellence presents a physique "inherited from the good old stock," whose osseous system and structure of the dental organs exhibit adamantine hardness and density; who has never experienced, until the time here related, an hour's sickness nor any kind

of toothache, who informed me that she had been afflicted with "spinal irritation"—whatever that means—for which she had been treated by her family physician—not dentist this time—about four and a half years previous to being introduced to me; during which period she had been confined to her bed, or couch, for *more than half the time*. The simple, graphic manner she described the origin, direction and distribution of pain, from the base of the head to the loins, to the left arm and whole region of the left side, the spine forming the base of the pain, as well as its line of demarkation. I recognized at once the remote and exciting cause to be the dental organs. She laughed. "Why," she exclaimed, "I never had anything the matter with my teeth." I explained that the "spinal irritation" was due to the gums receding from the teeth and their sockets, and that the irritating effects of the atmosphere and other agents affected them, these again affected the dental nerves, which joined their external and extended branches with the spinal nerves of the neck, which more or less affected the whole spinal column, branching on the side of the spine corresponding with the side on which the teeth were affected. I then examined her teeth, and found my diagnosis to be correct. I found that the gums had partially receded from all the teeth, not causing this distress, but that the gum between the central molar and wisdom-tooth on the left side of the lower jaw was absorbed, leaving the fangs and their alveoli entirely exposed. As the preliminary I had adopted precisely the same treatment I had commenced with the above quoted case with permanent success, now five years without any symptom returning. Had medical treatment failed I should have extracted the wisdom-tooth, because pain or neuralgic distress—except at the time of their eruption through the gum—is never or very rarely experienced *in* the teeth themselves,* therefore offering no other diagnostic marks than the remote pathognomonic *and sympathetic* symptoms.

HOT-WATER-PROOF CEMENT.—The following is a valuable cement, which, if properly applied, will be insoluble even in boiling water: Gelatin, 5 parts; soluble acid chromate of lime, 1 part. Cover the broken edges with this, press lightly together, and expose to the sunlight: the effect of the latter being to render the compound insoluble.

* Very many perfect teeth—anterior molars and bicuspid, etc.—have been lost to their owners from the fact that the pain in the wisdom-teeth is most often experienced in those teeth anterior to them, extending to the facial mesial line; and persons ignorant of this have urged the more uninformed dentist to extract the teeth in which they *felt* the pain.

MEETING OF THE FIRST DISTRICT DENTAL SOCIETY.

AT THE RESIDENCE OF DR. ATKINSON, NEW YORK, TUESDAY EVENING,
NOVEMBER 7TH, 1876.

The meeting was called to order by the President, and the minutes of the last meeting read by the Secretary, and approved.

Dr. Atkinson, of the Committee on Clinics, reported that they had a fair attendance of spectators, though only one operation was performed, at the hand of Dr. C. F. Stockton. In reference to the little boy who was operated upon some time since, the enlargement on the right side was now not more than one-third as large as it was when I first saw it a year ago. That has not been operated upon at all, but treated externally. There was some discussion to-day as to what the character of it was. It was the opinion of some that it was an abscess; others thought that it was a blood cyst, while others thought it an enlargement of the blood vessels. My own opinion is that it is a mucous cyst, because, when pressed with the finger, there is still an enlargement on both sides of the finger, indicative of what I term a supplementary mucous cyst. In reference to the treatment, he stated that he received a letter last week stating that everything was going on very favorably, and his opinion was that it would not require any further operation.

The subject of the evening being "*Incidents of Office Practice*," Dr. Lord reported a case which had come under his observation in which the gums were very much swollen. There was no inflammation, and on pressing with the finger the gum would give.

DR. ATKINSON said: The wall of the bone is dissolved, producing a honey-like fluid, very soft, like thin mucous. It is not malignant, and the process of cure is to simply irritate enough on the inside to excite granulation from the epithelial surface, and the reproduction of new teeth. If the contents were glairy, then I should follow with washing it out thoroughly, and an injection of chloride of zinc, 20 grains to the ounce.

DR. J. S. LATIMER said: A lady whom I have attended has suffered very much from a swollen face on the side of the right superior molar, but not from that tooth. The first superior molar on that side was very blue, and I thought that might be the cause of the difficulty. I find that any cause that lowers vitality lessens the probability of saving the teeth.

DR. ATKINSON : Pus is dead corpuscles. You can call anything else pus. It is the different stages of progress ; as, the juice of the apple, then the fermentation, which is called vinous, and then acetic acid. Suppose I say that a certain kind of blue indicates the congestion of the capillaries, but I cannot describe it any more than I can describe color.

The subject of the evening, " Diseases of the Dental Pulp, their Sequences and Treatment," being announced by the President—

DR. BODECKER said : I first make the cavities perfectly clean, then excavate as far as I can, and use creosote and oxychloride. I mix oxide of zinc and creosote just to a creamy consistency, and put it over the pulp, leaving it until you can put the oxychloride over.

DR. LEOPOLD OSTERMANN said : The practice in Germany, where there was a good deal of inflammation, was to first cleanse the cavity, then use a mixture of carbolic acid with oxychloride of zinc and creosote.

DR. HUNT, of Washington, said : I do not know that there is any objection to the use of oxychloride of zinc. In some cases I think it is a good protection of the pulp to prevent irritation and injury, but any neutral substance can be used. I used to use carbolic acid, and then used creosote with oxide of zinc. In cases where the pulps are exposed I treat them with creosote ; in other cases I use oxychloride until I am satisfied that the parts have resumed their normal condition. The great difficulty with me has been the restoration of the normal condition of the pulp after congestion had taken place. I doubt very much that it is possible to restore the pulp when there is any congestion in the blood vessels of the pulp. We cannot tell the condition of the blood vessels in the body throughout the pulp, because I have operated in those conditions and have often found congestion, but far removed, and so far removed that there is no possible means of preventing that congestive condition. We know what congestion is, and we know that this congestion, or you may call it extravasation, must be removed in some way, either by sloughing or absorption. If by absorption, it must be taken up and carried in the system. In other parts of the system it can be carried off without positive injury, but if the pulp is in this condition we are never safe, because we all know that disease is the best general in the world, always attacking the weakest point. In treating an exposed pulp I first cover it with the oxychloride, and leave it sufficient time to be satisfied that the functions are all normal. I have filled the right superior second bicuspid without any trouble and without the slightest injury. The tooth did not suffer at all. If there had been any trouble at all, the temporary stopping could have been taken out. The object is to replace that bone and fill it up with something else.

DR. JOHN ALLEN: If you could draw a line exactly between irritation, inflammation and suppuration, then you would be able to diagnose a case. There are three states of pulp disease. When the operator exposes the pulp, in that case it amounts to irritation. If the irritation can be stopped at that stage of the case, so that the irritation will cease before inflammation follows, then I think that the pulp can be saved. But there is where the great point comes in—you are not always ready to draw a line between irritation and inflammation. After the irritation has gone on to inflammation, and that inflammation followed by suppuration, then I think it is useless to try to save the pulp. When it has gone thus far, then the proper course and one that I have always pursued is to take it right out as quick as possible, allowing all inflammation and disease to thoroughly subside before filling. In some cases the irritation and inflammation will all pass off in two days, while in other cases you will require as many weeks as days, so that no definite time can be calculated upon. I say if we could draw a line, so as to know exactly what we are doing all the time, then we could define these things better than we do. But it seems to me that we should not have a fixed rule for all pulps. There are many cases where inflammation has occurred and finally suppuration has followed in spite of all I could do, and I could not always draw a line between that stage of inflammation and suppuration. If it goes on suppurating it is a gone case, as a general thing.

In later years I look back to my earlier days, forty-six years ago, when there were many more pivot teeth inserted than there are now. It was then not unfrequently the case that the pulp would be exposed, in which case the practice then was, almost invariably, to cut the crown off, take out the lining membrane with a small instrument, excise it and remove it, drill that tooth out, and put a pivot tooth on it at once, and I seldom ever knew inflammation to follow where a case was treated in that way. I have known pivot teeth that would be worn for twenty-five years and do good service, and I never knew a case of inflammation occurring where I could have an opportunity of taking the lining membrane out at once; and in a tooth that should be treated in the same way in filling, I should look for the same result.

DR. WM. H. ALLEN: In treating exposed pulps, I feel satisfied from the appearance and indications of *some* that they will give no trouble, and I have treated them time and again as I would a pulp that was not quite exposed, and without disappointment, as a general thing. I seem to know such pulps by intuition, and have in the last forty years filled

many such teeth by first capping them with some non-conductor, such as cork, wax, horn, gutta-percha and Hill's stopping, and then finishing with a solid metallic plug, without fear of after trouble. Only a short time since I filled the tooth of a man where the pulp was largely exposed in this manner, and he has had no trouble since.

About the same time I filled a large molar tooth for a domestic of mine, which had become considerably inflamed. I bled it and made an application of creosote, which stopped the blood and pain at once, then capped it with a thin piece of cork wet with creosote and covered that with Hill's stopping, leaving the tooth filled with that for about ten days. At the end of this time, as she had had no trouble with it, I thought I would cut out part of the soft filling and put in amalgam, in doing which I loosened the whole plug, and it came out, exposing the pulp again and making it bleed. I treated with creosote, coated the inside of the cavity with gutta-percha dissolved in chloroform, replaced the old capping *in situ*, where it fitted and was stuck fast by means of the gutta-percha paste, and then filled with amalgam; this was done four or five months ago, and has given no trouble since. The tooth appears to be still alive. This is one of the cases which I never hesitate to fill solid, immediately.

There are, however, many similar cases, in the mouths of persons of delicate appearance and sensitive nerves, where the results might be very different. I find in many cases they *will not be saved*, the best I can do.

I have often found extreme sensitiveness in the small pulp canals when the main body of the pulp had been dead for many years.

Only a few days since I saw such a case in the root of a central incisor which had been filled seventeen years ago by Dr. Allport, of Chicago. The pulp in the upper third of the canal was as sensitive as ever, and I left it as I found it, setting a pivot tooth upon the root, the natural crown having been broken off.

I consider it, philosophically, as reasonable and correct practice to preserve alive exposed tooth pulp as any other tissue of the body, though it may be more difficult.

DR. J. S. LATIMER said : He had used a saturated solution of salicylic acid, and thinks it may be beneficial in some cases.

DR. ATKINSON : Glycerine, the non-crystallizable, being a neutral substance, and having little affinity for anything outside of it, is just as good a filling as you can have. It is no matter what we use, if it is a neutral substance, so that there shall be no opportunity for chemical disintegration. In many cases I have taken out drops of pus and refilled the

tooth afterward. Now, what is the condition? There is a set of cells that we meet on the periphery of every pulp, and if you can get these to lap over so as to close the cavity, you can get secondary dentine. I will never fill gold against that secondary dentine. I don't care whether the pulp is exposed or not, I would never put a large mass of gold in a tooth so as to come near the pulp. I should fill with oxychloride or any other thing, and then fill with gold. So far as the difficulty of filling, you can fill over a cap with a very infinitesimal filling on any point that is exposed.

It is not wise for us to try to improvise difficulties. I owe more to that inspiration that was called back-bone in me, and fool-hardiness, and all that sort of thing, and which I now recognize as inspiration.

Now suppuration need not be destruction. It is just the same as fatty degeneration—that is to say, any tissue that is converted into a fat cell, that is the process, and is very nearly suppuration. Suppuration is merely converting a living tissue into a dead one. Exposed pulps or diseased pulps are not unlike, in their operation, some of the tissues, and has evidently the same sort of deteriorating function as any other part of the body. I can show you any amount of pulps that have been exposed and secondary dentine formed, and it always forms at the expense of the soft tissues.

Adjourned.

ALVEOLAR ABSCESS, DEPENDENT ON DISEASED TEETH.

Read before the Odontological Society of Great Britain, by G. D. POLLOCK, F.R.C.S., President of the Pathological Society of London.

MR. PRESIDENT AND GENTLEMEN:

The consideration of Alveolar Abscess can be nothing new to the members of the Odontological Society, but it must always be one of interest, as it is by no means an uncommon occurrence, and is not unfrequently important in its consequences. Moreover, it is a condition which may especially be said to bring together in consultation the dentist and the surgeon; and, as far as my experience goes, the cause of the mischief is too frequently overlooked by the medical practitioner. I hope, therefore, I need offer no apology in making it the subject of the present communication.

I have so frequently had occasion to call the attention of our pupils at St. George's Hospital to this subject, that I have occasionally almost felt that I might be supposed to be riding a hobby too hard. But your

President will bear me witness that, with all we have done and said in past years, the recurrence of such cases—I might almost say monthly—proves that the subject is not too generally or fully appreciated; that the cause is frequently overlooked by the medical attendant, and that the patient is consequently permitted to linger on in discomfort, and often with disfigurement.

Alveolar abscess may be considered as of two varieties—one of a superficial and comparatively innocent character, popularly known as gum-boil; the other of a deeper formation, and complicated with various conditions, and what we may truly designate as perforating alveolar abscess. Gum-boil may occur on either side of the alveolus, forms quickly, and usually, when opened, heals as quickly. I do not propose to deal more with this class of cases than to express the opinion that if the abscess recurs frequently, as it is occasionally apt to do, care should be taken to examine thoroughly into the condition of the tooth, and, as regards treatment, to give vent to matter as early as possible. How far simple inflammation of a healthy tooth, or a defective or carious condition, gives rise to such an abscess, we need not now stop to inquire. The more formidable and deep-seated abscess, originating in the alveolar cavity—most often at the extremity of a fang—and which makes its way through the alveolar process, and as a rule outwards—true alveolar abscess, which constantly demands the aid of the surgeon—is the chief subject I wish to draw attention to.

The cause and the mode of origin of alveolar abscess have been well and fully considered by those who have already written on diseases of the teeth. I think, however, it is desirable to refer shortly to some of these observations. Hunter* in reference to this says:—"Sometimes deeper abscesses occur than those commonly called *gum-biles*. They are often of very serious consequences, producing carious bone. They commonly arise from disease in the tooth, and more especially in the cuspidati; these teeth passing further into the jaw than the others. Their depth in the jaw being beyond the attachment of the lip to the gum, if an abscess forms at their points it more readily makes its way through the common integuments of the face than between the gum and lips, which disfigures the face; and when in the lower jaw, looks like the evil. In the upper jaw it makes a disagreeable scar on the face, about half an inch from the nose. These, although they may sometimes arise from diseases of the teeth and gums, yet are properly the object of common surgery, and the surgeon must apply to the dentist if his assist-

*"The Natural History of the Human Teeth," p. 171.

ance is necessary to pull out the tooth, or to perform any other operation which comes under his province."

Fox* says:—"Carious teeth frequently become inflamed at the root, and suppuration takes place in the socket, attended with swelling and soreness of the gums. In these cases the same laws are observed for the exit of matter as in abscess in general; viz., ulceration takes place in some part of its surface, so as to make an outlet for the matter in the best possible situation. When matter forms at the root of a tooth, the periosteum which covers its fang thickens, and in some cases becomes detached from it; the matter is accumulated as in a bag, by the extension of which considerable pressure is made against the sides of the socket, the consequence of which is, that that part of the alveolar process situated on the outside becomes absorbed, rather than that within the mouth.

Mr. Tomes† says:—"With the formation of pus a process is established for effecting its escape. Either the periosteum becomes detached through the whole length of the fang, and the matter is discharged at the neck of the tooth, or, what is much more common, a hole is formed in the wall of the alveolus, through which the pus gets into the gum. In some few cases, in which the inflammation implicates to a considerable extent the adjoining tissues, the abscess, instead of opening in the gum, extends into the cheek and opens on the surface of the face, and through the opening pus continues to be discharged till the tooth is removed."

Mr. Bell‡ remarks that, "of all the diseases which attack the gums and alveolar processes, none is so common, and, perhaps, few are so frequently misunderstood, as that which is commonly termed '*gum-bile*.' The very name which is popularly given to it is at once a proof of the mistaken notion commonly entertained respecting its nature, and a means of perpetuating the error. The gum is, in fact, only secondarily affected, the cause being invariably seated within the alveolus. I propose, therefore, to call it alveolar abscess, as more correctly designating its true nature and situation. It is produced by various causes. Now and then, though very rarely, it is the result of inflammation of the periosteum of the sound tooth, from cold or some other local cause; it may arise from mechanical injury to a tooth, as its being loosened, or partially dislocated by a blow. The irritation of toothache is also a common cause of its occurrence; but by far the most general is the existence of a dead tooth or root, acting as an extraneous body in the socket."

* "The Natural History and the Diseases of the Human Teeth," p. 69.

† "Dental Physiology and Surgery," p. 279.

‡ "The Anatomy, Physiology and Diseases of the Teeth," p. 217.

Mr. James Salter says :—"The presence of dentinal caries is its most frequent cause by far, and it may or may not be preceded or accompanied by toothache."

Whether any other causes than caries of a tooth be productive of alveolar abscess I cannot say ; but as far as an experience now extending over some years enables me to express an opinion, I can say truly of the many instances which have come to my notice, I have never seen one in which a defective or a carious tooth was not the cause of the mischief. The results of these abscesses are so various, their treatment is so often misunderstood by medical men, their complications and consequences are often so serious, and so constantly call for the interference of the surgeon, that I propose to relate my experience of some of these results.

From all I have observed, it seems to be by no means an uncommon circumstance that a patient should suffer no inconvenience from the presence of a decayed tooth, the cause of an alveolar abscess, until some external swelling or disfigurement, or disagreeable discharge from the nose takes place, and not till then does the patient have recourse to medical advice. It is this absence of toothache, I think, which leads so frequently to the true cause of alveolar abscess, with its consequences, being overlooked. That the formation of the abscess is often almost painless and quite free from toothache I have seen exemplified in several cases. It has often happened to me to observe that when abscess has made its way externally, pain in the affected tooth is the last thing the patient would acknowledge; nor until the appearance of the swelling has the patient been aware of anything wrong. I conclude that, in such cases, the progress of the abscess has generally been very slow; or, perhaps, some partial outlet to the matter has occurred through the decayed tooth, or that the perforation of the outer plate of the alveolus has occurred so early as to have allowed freedom to the pus, and that the patient has probably forgotten the pain he at first suffered, from its having been but slight.

Matter having once passed through the outer plate, may make its way in various directions, dependent somewhat on the position of the decayed tooth and its various surroundings.

I believe the rule holds good that all serious or important results are due to the abscess opening outwards, or upwards when in the upper jaw, the most common course; when it opens inwards it is, as far as I have observed, superficial, and readily heals.

If the abscess has been allowed to open externally, or has been opened by the medical attendant, when pointing in any part externally, and the offending tooth be not removed, the abscess soon contracts, but a sinus

remains. The orifice of the sinus contracts, but becomes prominent, while the surrounding tissues become thickened and hardened. So that we observe in such cases a small elevated mass of infiltrated tissue, in the centre of which is often a nipple-like point of granulation, through which a fine probe may be passed deep down towards the surface and base of the alveolar process. If the thickened patch be taken between the fingers and attempted to be moved over the jaw, it will be found more or less adherent to the latter, often tied by a kind of string-like process to that part of the jaw in which the diseased tooth lies.

A lady was recommended to consult me by my friend, Dr. Abercrombie, of Cheltenham. She had for two years suffered from an ulcer on the right side of her face, midway and a little posterior to a line drawn from the angle of the mouth to the base of the jaw. For its relief various local measures and much constitutional treatment had been ineffectually resorted to. Suspecting the cause of the ulcer, I examined the mouth, and found a decayed stump in the lower jaw corresponding to the situation of the ulcer. As soon as I alluded to the state of the tooth as its cause, the patient at once expressed her doubts on the point, as she stated she had never suffered from toothache. I, however, strongly recommended the removal of the tooth, as it offered the only chance for the ulcer to heal. I heard nothing more of my patient for some weeks, when she called to thank me for my advice. She applied to Mr. Rogers after she first saw me, and as he entirely confirmed my view of the case, the tooth was removed by him. The ulcer soon healed, but there remained a scar, which time alone could soften, but would never entirely remove.

In another case, after much or little pain about a tooth, a patient will complain of offensive discharge from the nose; and it is usually some assistance to the surgeon to note that this discharge is most distinctly referred to one nostril by the patient.

A gentleman consulted me a few years ago who had been for some two or three years a sufferer from constant offensive discharge from his right nostril. His health was good, his habits temperate, his residence the country; nor was there any suspicion of syphilis or scrofula. There was a constant disagreeable discharge from the right nostril. When lying down he was conscious of its trickling down the pharynx. He had been under much local and general treatment, with no apparent benefit. After careful examination of the nostril, which gave no evidence of disease, I examined his mouth. I could not detect anything like a carious tooth, but one—the first molar—looked a little more discolored than the rest.

I tapped it sharply with the steel handle of a small instrument. This immediately made the patient wince. The tooth was unnaturally tender, and by my advice it was removed. A few days after he called to report improvement. The tooth produced was dark-colored, with its fangs inflamed. At the end of six weeks he had lost all sense of the discharge from the nostril, and when I saw him some time subsequently, he had quite recovered from this very disagreeable condition.

I could record other cases of abscess in the antrum, the result of decayed teeth, but this one case is sufficient to illustrate my statement, that much discomfort may occur with a defective tooth without the patient being cognizant of toothache.

The cases related may be considered comparatively simple in their results; but the effects of alveolar abscess are not always so. The following cases will prove my statement: A man was admitted into St. George's Hospital, under my care, with a large brawny swelling on the right side of his neck, extending from the surface of the jaw to the clavicle. It had encroached so much on the median line in front that the larynx was much pushed to the left side, and this produced a good deal of difficulty in breathing. He could not open his mouth to allow a proper examination of the teeth; but I suspected a bad tooth to be the cause of the mischief. Two incisions were made into the inflamed tissues with some relief. The following day there was more difficulty in breathing, and it was necessary to open the trachea to save life. The operation was rendered somewhat difficult by the displacement of the larynx. The swelling now began to subside, as there was free discharge from the wounds; and as soon as the mouth could be sufficiently opened, Mr. Vasey removed a decayed molar from the lower jaw, evidently the cause of all this mischief. The patient left the hospital quite well. But a short time ago I had to see a lady late one evening, with a large hard swelling between the chin and thyroid cartilage. She had some difficulty in breathing, and considerable difficulty in swallowing. A free incision in the median line allowed the escape of some very offensive pus, with great relief to her symptoms. I now examined her teeth; one lower incisor was painful on being tapped, and she consented to have it removed as soon as the swelling caused by the abscess had subsided. On removal, the extremity of the fang was found to be carious. After this she remained well for more than a year, when she again sent for me with another abscess in the same situation. After the abscess was opened, the left middle incisor, which was tender on being tapped, was also removed; and she remained well when last seen, some time subsequently.

Hunter, with his careful observation, has remarked that when abscess occurs in the lower jaw, it often "looks like the evil"; a condition to which, I conclude, we should apply the term "scrofulous" in these days. A well-marked and interesting case illustrative of Hunter's observation came under my notice at St. George's Hospital some few years ago. A comparatively healthy young woman was sent to me for a terribly bad ulcerated neck. From the base of the jaw, on the right side, to near the clavicle, was a mass of indurated, dark-colored, and thickened skin and cellular tissue, with numerous ulcerated openings on the surface. To a less extent the left side of the neck was similarly affected. I was asked to recommend her for a bed at the Margate Infirmary, as it was supposed she was suffering from scrofulous ulceration of the neck. I may state that the parts were so much indurated, ulcerated, and so dark red in color, that the general appearance was much more characteristic of the brawny condition of cancerous infiltration with ulceration than anything of a scrofulous nature. I was not, however, satisfied as to the character of this mischief, and made an examination of her mouth. On both sides of the lower jaw were numerous decayed stumps. I suggested their removal, and she was handed over to the dresser of the week to be relieved of these stumps. To my great satisfaction, in the space of a short time, with very simple local applications, all the ulcers healed, and the integuments of the neck assumed a natural healthy condition. About a year or eighteen months after this, she again applied to me for some recurrence of ulceration on the left side of the neck. I looked in the mouth and saw two stumps remaining in the left lower jaw. I taxed her with not having carried out the instructions I formerly gave, viz., to have all the stumps removed; upon which she replied, that she had had so many removed on that occasion, and as she had suffered a great deal of pain, she thought it would do no harm to allow these two to remain. She at once had them removed, and her recovery was as rapid as it was satisfactory. Mr. James Salter relates a somewhat similar case, and quotes another recorded by M. Robert,* in which suppuration extended to the shoulder and upper part of the breast, followed by death; and in which "it was shown that the suppuration had originated at the angle of the jaw, immediately in contact with the decayed wisdom tooth."

There are conditions, however, which, stopping short of the formation of matter, may prove formidable enough, which equally require the surgeon's careful attention and the early removal of the offending tooth.

Two cases of a most interesting character will illustrate my statement:

* "Conferences de Clinique Chirurgicale," p. 145.

Some few years ago I was asked to see a patient suffering severely from supposed disease of the right eye. He was suffering excessive pain. The right eyeball was so much protruded that the lids could not close over it, and in consequence of the exposure the cornea was becoming hazy and opaque. The eyeball itself was not very vascular, the pupil was widely dilated, and sense of vision entirely gone. I could not detect any disease in the eye itself to account for this protrusion. I carefully examined the orbit, but could not satisfy myself of the presence of any growth, nor could I feel anything like fluctuation from cyst or abscess. It occurred to me that some extraneous mischief might possibly account for the protrusion, as there was nothing in the condition of the globe or the orbit to explain it, the dilatation of pupil and loss of sight being probably due to the mechanical pressure on the eyeball and the stretching of the optic nerve. I made a careful examination of the bones surrounding the orbit, with a view to ascertain if any ossific implication might explain these conditions. On passing my finger down the side of the nose, the patient winced when it reached a point midway between the inner canthus and angle of the mouth. I immediately suspected a tooth might account for this, and on examination of the mouth found a stump in the upper jaw on the right side, and a molar next it which had been stopped. He made no complaint of toothache. It appeared to me almost too hopeful to expect that these defective teeth could possibly be the cause of such serious mischief; but as an operation had been suggested for the condition of the eye, it was agreed that these teeth should be first removed before any other operative measures were had recourse to. The following day Mr. Vasey removed both stump and stopped tooth. The fangs were inflamed and thickened, but there did not appear to be sufficient to account for such an amount of mischief.

The result was most satisfactory; pain immediately commenced to subside and the protrusion to diminish. At the end of a week the patient was able to close the lids over the cornea, and the latter entirely recovered its natural lustre. At the end of a fortnight it was difficult to say that there had been anything the matter with the eye, except that the pupil was still somewhat dilated, and insensible to the stimulus of light. Subsequently, though vision was not restored, the pupil acted properly in accord with that of the sound eye.

Some two years subsequently to this attack the patient called on me, and stated that he had pain at the back of the left orbit—the opposite side, and as he was about to be absent from England for some time, he wished my advice on this point. He now mentioned to me that some

time prior to the attack in the right eye he had distinct recollection of pains at the back of the right orbit, but that, as they were not very severe or persistent, he paid no further attention to them. On looking into his mouth a decayed molar was seen in the upper jaw on the left side. This was removed with perfect relief to the orbital pain, and the patient has had no further trouble in this respect. Mr. James Salter has published a very interesting case of amaurosis, consequent on acute abscess of the antrum, produced by a decayed tooth, in a communication to the Medico-Chirurgical Society,* in which he did me the honor to refer to the case just related.

Another case, but less serious in its consequences, occurred to me three years ago. A lady residing in the South of France became subject to acute neuralgic pains about the right orbit and side of the head. This was gradually followed by some general thickening of the soft tissues below and around the inner margin of the right orbit, and gradually spreading outwards. There was also decided prominence of the globe when I saw her, a few months after the commencement of these symptoms, some slight double vision at times, and much headache. I could observe nothing in the condition of the eye, or the contents of the orbit, to account for the slight prominence of the former, beyond the general vascularity and the chronic thickening of the soft tissues, with slight periostial enlargement of the inner halves of the margins of the orbit. On examining the teeth, a molar in the right upper jaw was seen to be defective and discolored, and in front was a stopped bicuspid. By my advice the molar was removed by Mr. Normansell, who then recollected that he had drilled the body of this tooth some time previously; the aperture was still patent, and the tooth appeared defective and discolored.

The result, though partially beneficial, was not entirely satisfactory; the patient still complained of some pain, and suggested the removal of the stopping from the other tooth, as she thought it rather sensitive. This was done, and now steady, gradual improvement took place, and the patient has remained well since, with perfect recovery of vision.

A dentigerous cyst will occasionally be the seat of suppuration. A patient was admitted into St. George's Hospital under my care a few months ago, with an enlargement of the lower jaw on the right side, which, on examination, appeared to involve the substance of the bone. All the teeth (the three molars) over it had been removed previously to admission. On examination of the mouth a small orifice, from which pus exuded, was observed in front, between the cheek and the gum, and

* "Med. Chir. Trans.," vol. xlv., p. 355.

in the floor of the sulcus; a probe passed readily into a large cavity, but no bone or exposed tooth could be felt. The sac was freely laid open inside the cheek; the finger was passed into the cavity, which was felt to be lined by a smooth membrane, but no exposed bone or foreign substance could be felt. The cavity was dressed in with lint dipped in a strong solution of sulphate of copper. It rapidly diminished in size, and was gradually filling up when the patient returned home.

The cases related are of sufficient importance, I trust, to justify the time taken up by their description; and, I think, indicate fairly the very great necessity of attention being early given to the state of the mouth in all cases of ulcers, sinuses, or swellings in the neighborhood of the jaws. I would almost go the length to say that very few are the ulcers in this situation which have an independent origin; but that they are, in the great majority of cases, due to defective teeth and subsequent alveolar suppuration.

As to treatment I have but a few words to say, and it agrees entirely with the advice given by Hunter, Fox, Bell, Tomes and Salter. The rule is as simple as it is certain in its effects; the tooth or stump must be at once removed. In many cases I have seen the removal of the tooth sufficient to evacuate the matter locked up, and would recommend this to be done always in the first instance if possible. When, however, this operation does not effect the purpose, and the abscess has not made for itself any other outlet, it should be at once freely incised within the mouth.

The removal of the tooth will not, however, always prevent an abscess, once started, from becoming troublesome subsequently. In a case in which I was lately consulted, the offending tooth had already been removed—a molar from the right side of the lower jaw. But much induration remained about the outer surface of the bone. The patient was a young lady in rather delicate health; and though a free incision was made between the cheek and the jaw, matter continued to collect, and ultimately presented externally, and was obliged to be let out by means of a small external puncture. This soon closed, and the patient experienced no further annoyance. When a sinus has long been permitted to exist without the extraction of the tooth, it is very apt to continue to discharge long after the removal of the offending tooth. It becomes lined by a semi-cuticular membrane, and if fluid be injected, it will run into the mouth. Mr. Bell has recorded an interesting case of this kind, and I have quite lately seen one in which the patient used cotton-wool to plug the orifice. In such cases it is best at once to freshen the edges of

the puckered opening and bring them together by fine silver sutures, an operation usually followed by direct and permanent closure of the sinus.

I have met with a few cases in young persons in which a cyst has formed at the bottom of a defective tooth; and which, on being laid open, has disclosed the apex of the fang projecting into the cavity. On the removal of the tooth this point has been found carious. The cyst has always contracted and filled up after the removal of the tooth.

I look upon these cysts as differing in character from those known as dentigerous cysts, and as dependent on a necrosed condition of the fang. Ticdouloureux, or neuralgia, is, I believe, frequently to be attributed to the presence of decayed teeth, and such instances go to prove how indefinite in position and intensity are the pains dependent on such causes.

In conclusion, I would only add that the cases which have been related teach us this lesson—that in all instances of abscess or ulcer in the upper or lower maxillary regions, in certain cases of discharge from the nostrils, or in pains about the orbits, with defective teeth in the jaws, it is always best at once to have recourse to their removal; acting on the simple principle that it is best to clear away any doubtful point in the treatment of a case before recourse is had to any other measures; for the maxim of “an empty house is better than a bad tenant” applies equally to surgery as to commerce.

HEADACHES FROM EYE-STRAINS.

By S. WEIR MITCHELL, M.D., Philadelphia.

Dr. Mitchell avers that the general profession are not fully alive to the need of interrogating the eye for answers to some of the hard questions which are put by certain head symptoms, since many of the patients treated successfully by the correction of optical defects never so much as suspected that their eyes were imperfect. He submits the following propositions :

1. That there are many headaches which are due indirectly to disorders of the refractive or accommodative apparatus of the eyes.
2. That in these instances the brain symptom is often the most prominent, and sometimes the sole prominent symptom of the eye troubles, so that while there may be no pain or sense of fatigue in the eye, the strain with which it is used may be interpreted solely by occipital or frontal headache.

3. That the long continuance of eye trouble may be the unsuspected source of insomnia, vertigo, nausea and general failure of the health.

4. That in many cases the eye trouble becomes suddenly mischievous, owing to some failure of the general health, or to increased sensitiveness of the brain from moral or mental causes.

The form of head-pain caused by eye troubles is rarely of the nature of megrim, and, as it soon disappears when the eyes are corrected, is lacking, happily, in the obstinacy of that distressing malady.

A number of cases are cited to substantiate the above propositions, some of which we epitomize :

Case 1. A prominent merchant first consulted Dr. M. late in the winter for pain in the upper spine and occiput. In the previous autumn, only writing at first, and then later reading and any near work caused pain. Finally an over-sensitive state supervened, when a few moments spent in writing would give the patient a creeping sensation up the spine and through the back of the head, followed by giddiness and severe pain. The treatment adopted proved of no avail. Subsequently the patient consulted an ophthalmic surgeon, who found the vision defective, owing to an optical defect. The proper corrective glasses raised the sight above the average standard, and on using them habitually, the distressing symptoms quickly disappeared. The use of glasses, without other means, restored the patient to perfect health again.

Case 2. The patient, an accomplished and energetic single lady, aged 30, with heavy household cares, and additional literary work, began, some five years previously, to have evening headaches, pain in the back of the head and neck, sense of extreme fatigue, etc., if she persisted in exerting her mind in reading or writing, though without any sense of trouble in the eyes. At last she became feeble, nervous and anæmic, sleeping little and having almost constant headache, and the use of the eyes caused pain in them and a sense of fatigue. For nearly two years Dr. M. was at fault, but at length referred her to a specialist, April 19, who found the sight impaired, owing to an optical defect, and prescribed the corrective glasses. On May 26 the headache and sleeplessness had gone, patient could read and write without pain; used her glasses constantly. The relief of the ocular defect sufficed to restore the patient.

Case 3. Patient, a well nourished intelligent lady, with intense and frequent headaches, usually frontal, without sense of ocular fatigue. Long after the headaches had begun, reading was found to aggravate

them, and only rarely to cause fatigue or pain in the eye itself. The correction of an optical defect by suitable glasses gave almost immediate relief, and ere long put an end to the headaches.

Case 4. No eye-pain, but violent headache, described as neuralgic, with nausea and vomiting; optical defect present; prompt and absolute relief by correcting glasses.

Case 5. History of headaches, and later on of vertigo with insomnia; the subjective symptoms subsiding on wearing correcting glasses.

Case 6. Patient, a lawyer aged 51; a long life-time of active work and constant use of the eyes, but no trouble until one night of intense anxiety gave rise to threatening but brief cerebral symptoms, which at once seemed to make the use of the eyes painful. The cerebral symptoms (vertex headache, excitement of mind, etc.,) were such as to point rather to cerebral troubles than to the eyes as the cause of distress. On neutralizing an optical defect, by proper glasses, entire relief was afforded. A good example of the way in which a permanent unfelt defect is lifted into evil influence by some brief but potent disturbance of the cerebral centres.—*The American Journal of the Medical Sciences.*

BOOK NOTICES.

A MANUAL OF DENTAL ANATOMY—HUMAN AND COMPARATIVE. By CHARLES S. TOMES, M.A. Price, \$3 50. Philadelphia, Pa.: Lindsay & Blakiston.

This hand-book is one to delight the heart of the dental or medical student, the comparative anatomist, the paper-maker, printer, draftsman and engraver. Certainly since the DENTAL MISCELLANY was established no publication of equal merit—in mechanical execution, engravings, paper and printing combined—has come to the editorial rooms for notice.

Its author is well known on both sides of the Atlantic, and his work, although still that of a young man, has gained such reputation for thoroughness, that it is everywhere accorded position as authoritative. The scope of the work designed by Mr. Tomes may be best given in his own words from his preface. He says:

“The subject of Odontology, like every other branch of biological science, has of late years received many additions, some of which of much importance; nevertheless, these recent accessions to our knowledge are nowhere to be found in a collected form, but must be sought

for in the pages of various original memoirs, some of them not very accessible.

“But although the need for such a book has arisen, the compilation of a really comprehensive work on Odontology would be a task beyond my powers, and my aim in the present volume is a far humbler one.

“In the discharge of my duties as Lecturer on Dental Anatomy at the Dental Hospital of London, I have long been embarrassed by the want of any manual sufficiently recent to embody the advances which have been made of late years, and yet not too comprehensive in its scope, which I could recommend students to adopt for use as a text-book; in writing this volume my endeavor has been to supply this want.

“But the execution of my task has taken much longer than I at first anticipated; for it happened that recent researches in the field of development had materially altered our conceptions of the development of mammalian teeth, but nothing, or next to nothing, had been done toward extending these researches to the development of piscine and reptilian teeth, while to have issued the book with such a hiatus would have been very unsatisfactory.

“To the elucidation of this branch of the subject I first addressed myself, and in the section of the book relating to the development of the teeth, of Fish and Reptiles especially, which is necessarily somewhat brief, alone can I lay claim to originality.

“In the rest of the volume I have freely used whatever material was available; I should more particularly mention my father's Lectures on Dental Physiology and Surgery, Professor Owen's Odontography and the more recent chapters on this subject in his *Anatomy of Vertebrate Animals*, Professor Flower's Lectures on the teeth (as reported in the '*British Medical Journal*,' 1871), and Kölliker's and Stricker's Histologies, as having been laid under contribution, as well as many other works to which reference is made in the text.

“Some little resemblance will be found between portions of this volume (especially Chapter V) and portions of my father's '*Dental Surgery*,' which, in the absence at the time that it was written of any recent work on Dental Anatomy, contained a good deal more strictly relating to this section of the subject; and the resemblance was the less avoidable, inasmuch as the '*Dental Surgery*' was revised and added to by myself some three years ago.

But as this is intended for a student's manual I have not attempted to give references to all the authors consulted, nor to give authority for the statements made, save where the importance of the work, or the gen-

eral acceptance of views adverse to those adopted in the text, seemed to require it.

“By the kind permission of the council of the Odontological Society I have made use of a considerable number of blocks illustrating papers by other writers in the Transactions of that Society; many of the figures representing the forms of the several human teeth are borrowed, by permission of the publishers, from my father's Lectures on Dental Physiology and Surgery, while the cuts illustrating the growth and development of the jaws are mostly taken from the earlier chapters of the second edition of my father's Dental Surgery; a few illustrations have also been borrowed from Wilson's Anatomy and Frey's Histology; with a few exceptions the remaining illustrations, upwards of a hundred in number, have been specially executed for this volume from original drawings and specimens.”

The work is fully and beautifully illustrated, and we think each thoughtful dentist will hardly deny himself the pleasure of owning and reading it (the younger men will have been much more than ordinarily schooled in comparative anatomy if they do not need to *study* it); still, as there are always some who are slow to avail themselves of such privileges, even though they are offered at their door, we shall, as occasion offers itself, give our readers a selection from its pages. The handsome plate that adorns this issue, as a frontispiece, is a reproduction of one of several full page illustrations in the book. We add, not by way of advertisement, but of accommodation rather, that we will forward the book, free of postage, on receipt of the publishers' price.—ED.

THE NATION. Office, No. 5 Beekman Street, New York. A weekly paper of some sixteen quarto pages of reading matter. Subscription price, \$5 20 per year.

We have not felt it incumbent upon us to review in our pages each of the various exchanges that come, at their stated intervals, to our editorial rooms—in fact, we have seldom publicly noticed any one of them. When, then, we single out for comment from the list one which has nothing whatever to do with our specialty, we think our readers will conclude that it is because we consider it especially worthy of notice, and they would be right if they should also conclude that we do it entirely in their behalf. The paper, a weekly, is by no means always of our way of thinking, in some instances diametrically opposed, but we believe it able and always sincere in the view it presents editorially. It is a scholarly résumé of the news—political, literary and artistic—of the week. Its English is generally elegant, and its tone pure and intellec-

tual. It is somewhat judicial in its style of comment, so much so that some wag has dubbed it "a weekly day of judgment."

If one is so situated that he can or will forego the dissipation of which we, as a people, are almost universally guilty—the skimming or half-reading of the daily prints—and will provide himself with *The Nation*, he can once a week afford to read it thoroughly, and besides enjoying an intellectual treat, he may be sure that with the fewest words and in the shortest time he has been put *au fait* with all that has transpired of permanent interest or importance, or that has considerably engaged the thoughts of the reading public since its previous issue. We presume copies can be had for inspection by application, by letter, at the office. It may be well to add that one's taste for this kind of reading increases with its exercise, and the first number will be the least relished.

A person of culture once on the subscription list will not readily allow his name to be dropped therefrom. We notice that subscriptions can commence at any time.—ED.

New York, December 13, 1876.

MR. EDITOR: I notice in the November number of the DENTAL MISCELLANY an error as reported in the proceedings of a recent meeting of the First District Society of New York. The remarks accredited to Dr. J. Allen with reference to a gentleman who had some financial trouble, were not made by me. You will, therefore, please correct as above, and oblige

Yours truly,

J. ALLEN.

NOTES.

Mixing Amalgams.

A simple and *handy* hand mortar for mixing amalgams. Take one of the "*depressed coffer dams*," cut out the cup or depression, and you have a flexible mortar. Place the proper quantity of mercury and filings in the mortar, bring the lips together, and with the forefinger of the right hand and the palm of the left, you have the mill or pestle. This obviates the old difficulty of blackening the hand and finger, and prevents the possible or much feared absorption of free mercury into the system

through the epidermis. Also, the filings and mercury are more readily united, and a smaller quantity of mercury will be necessary.

C. M. WRIGHT,

——— *Switzerland.*

Salt Cakes as Current Coins.

The step from precious metals to salt may seem, at first sight, a long one, but in parts of Yunnan salt cakes are as much current coins as are copper cash in the rest of the empire. Marco Polo tells us that in his day "their (the natives') small change again was made up in this way.

They have salt which they boil and set in a mold (flat below and round above), and every piece from the mold weighs about half a pound. Now 80 molds of this salt are worth one saggio of fine gold, which is a weight so-called. So this salt serves them for small change." This statement, though vaguely put, is as accurately true now as it was then, with the exception that the molds of the present day weigh 113 pounds instead of half a pound. The salt, in the first place, is drawn from the brine wells, and condensed in pans of the shape described by Marco Polo. Each cake is stamped with the government seal, then either finds its way to the consumer, or for a time passes into circulation among the hill tribes and the Chinese in their neighborhood. Most of the wells are in the southern portion of the province, and it is only quite lately that silver has begun to take the place of salt in mercantile transactions in cities situated in the neighborhood of Poo-urhtoo and Scumaou. The hill tribes attach great value to salt, and the chief aim of their constant raids on Chinese villages is to steal it. The Chinese, in their turn, use it as an instrument with which to plunder the hill tribes, who willingly exchange the commodities at their command, such as gold, musk and skins, at ruinous rates for the coveted necessary. It is almost needless to say that, being thus valuable, salt does not escape the notice of the mandarins, apart from the imperial tax upon it; but as it is comparatively cheap, the official difficulties it has to struggle against in its production are not so great as those which surround the various processes connected with gold, silver and copper.—*Cornhill Magazine*.

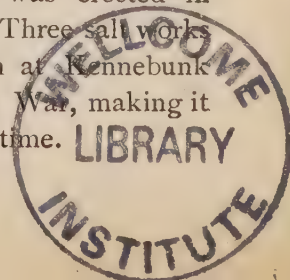
Isthmus of Panama Canal.

Rear Admiral Cochrane has written to the *London Standard*, suggesting that it would be to the interest of England, if steps were taken for surveying a route for a canal which is traced by proceeding up the Bayano River, which debouches into the Pacific about 20 miles to the eastward of

Panama, to a farm or village called Jesus Maria; from thence, in a more or less direct line, to proceed to the harbor of San Blas, on the Atlantic. The map "Self-ridge's," and admiralty chart, demonstrates at a glance the advantages of adopting this route on account of its shortness, if it is found on survey to be otherwise suitable. The course he recommends for survey is the shortest across the Isthmus of Panama, viz., about 29 miles. He states that he ascended the Bayano River in May last, with two steam pinnaces, to Jesus Maria, in three and one-half hours of steaming, and carried a depth, excepting over some sand bars, of several fathoms. There he caused to be obtained observations for latitude and longitude, which showed that he had attained within 19 miles, in a direct line, of the port of San Blas, on the Atlantic, and the tidal rise of the Pacific extended several miles beyond the point attained by him.

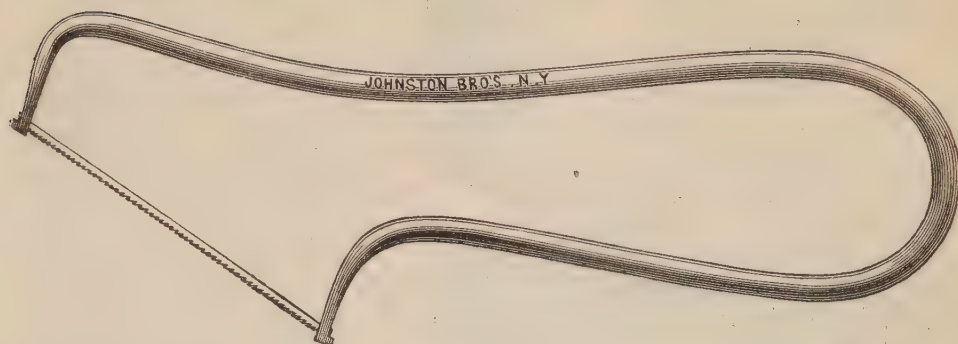
Early Iron Making in the Province of Maine.

An Eastern paper, the name of which is not at hand, has the following scrap of information in regard to iron making in the Province of Maine, now State of Maine. An iron furnace was erected on the Mousam River, in Kennebunk, Maine, in 1774. "The iron was made in bars weighing 25 pounds and upward. Some of the mines were owned by mill owners, others dug ore and hauled it on their own account, receiving therefor two to four dollars a ton. The factories were in operation twenty years." People residing at Saco used to go to the factory at Kennebunk for iron on horseback. One bar hoisted upon the saddle was a load. Before 1774 all the iron came from England, but the signs of the impending revolution led to the erection of this iron factory as a matter of precaution. A similar establishment was erected in Kennebunk a little later. Three salt works were also put in operation at Kennebunk during the Revolutionary War, making it quite a busy town at that time.



CLAPP'S SAW FRAME.

PATENT APPLIED FOR.



In the form shown here this instrument, the device of Dr. Dwight M. Clapp, will be found very useful as a saw frame. The saws are firmly held in place, but can at pleasure be detached or inserted by pressing the wires of the handle together, the thumb being placed just beyond the extremity of the saw, on the handle, for that purpose.

PRICES.

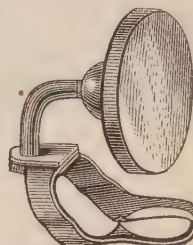
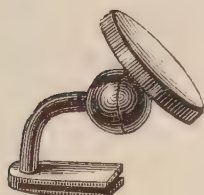
Saw Frame.....	50 cts.
Saws, per dozen.....	20 cts.
Frame and three dozen saws, postage paid.....	\$1 00

JOHNSTON BROS.,

812 Broadway, N. Y.

REFLECTORS.

PRICE REDUCED.



PATENTED FEB. 16th, 1875

This reflector is designed to concentrate a strong light upon the cavity. It is so constructed that it can be readily attached to any rubber dam clamp, and by means of a ball joint the mirror can be adjusted to throw light upon any point in the mouth. The operator will readily perceive the great advantage to be derived from this invention in operations upon posterior cavities in molars. The mirror being held in position by the clamp (as shown in one of the cuts), the hands of the operator are entirely free. It is thought that two sizes will meet all requirements.

PRICES.

No. 1, diameter $\frac{1}{2}$ in., plane or concave.....	\$2 00
No. 2, " $\frac{3}{8}$ in., " " "	2 00
Set.....	\$4 00

JOHNSTON BROS.,

812 Broadway, N. Y.



DIAMOND AMALGAM

Is one of the alloys of gold, silver, tin and platinum that have been deservedly popular for the past few years.

It was originally made by a firm in Philadelphia—now retired from business—and was very greatly liked. It was out of market for some little time, but it is again offered, put up in boxes with *chemically pure mercury* sufficient in each box to amalgamate the alloy, and with a piece of buckskin in which to express the surplus mercury. We believe it fully equal to any of the higher priced amalgams in the market.

PRICES.

In oz. boxes with pure mercury..\$4.00
 In $\frac{1}{2}$ oz. boxes with pure mercury 2.25
 In envelopes, per oz..... 3.80
 In envelopes, per $\frac{1}{2}$ oz..... 2.00
 A liberal discount to the trade.

JOHNSTON BROS.,

812 Broadway, N. Y.

HOUGHTON'S OS-ARTIFICIAL.

IMPROVED.

ITS SUPERIOR QUALITIES ARE

Extreme Toughness,

Strength,

Flint-like Hardness,

and Insolubility after Hardening.

Put up in glass stoppered bottles containing nearly ONE-HALF OUNCE.

Price \$1.00. Sent by mail.

For Sale in any quantity by

JOHNSTON BROTHERS,

812 Broadway.

ELLIOTT'S AMALGAM CARRIER.

The convenience of this little tool is self-evident.

PRICE.

Nickel-plated\$2 50

JOHNSTON BROS.,

812 Broadway, N. Y.

Elliott's Parting Fluid.

A preparation which enables the practitioner to finish his cast in a neat manner, much quicker than is usual by the use of varnishes. The bottle should be well shaken before the Fluid is applied to the cast.

Price per bottle.....35 cts.

Manufactured and for sale by

JOHNSTON BROS.,

812 Broadway, N. Y.

HOOD & REYNOLDS' GOLD CYLINDERS.

STYLE A,

Loose, and can be used as Pellets.



STYLE B,

Loose, but more compact than Style A.



STYLE C,

Compact, but not Hard, used as Cylinders only.



These numbers are to denote that No. $\frac{1}{2}$ is a half sheet of No. 4 Gold Foil, cut into strips and rolled into cylinders. No. 1, one sheet; No. $1\frac{1}{2}$, one sheet and a half; No. 2, two sheets, etc.

TWO PATENTS, SEPT. 19, 1876.

PATENT SEPT. 25, 1876.

Orders accompanied by cash we will fill, free of charge for delivery, at the following

PRICES.

Per $\frac{1}{8}$ oz \$4 50
 " $\frac{1}{2}$ " 17 00

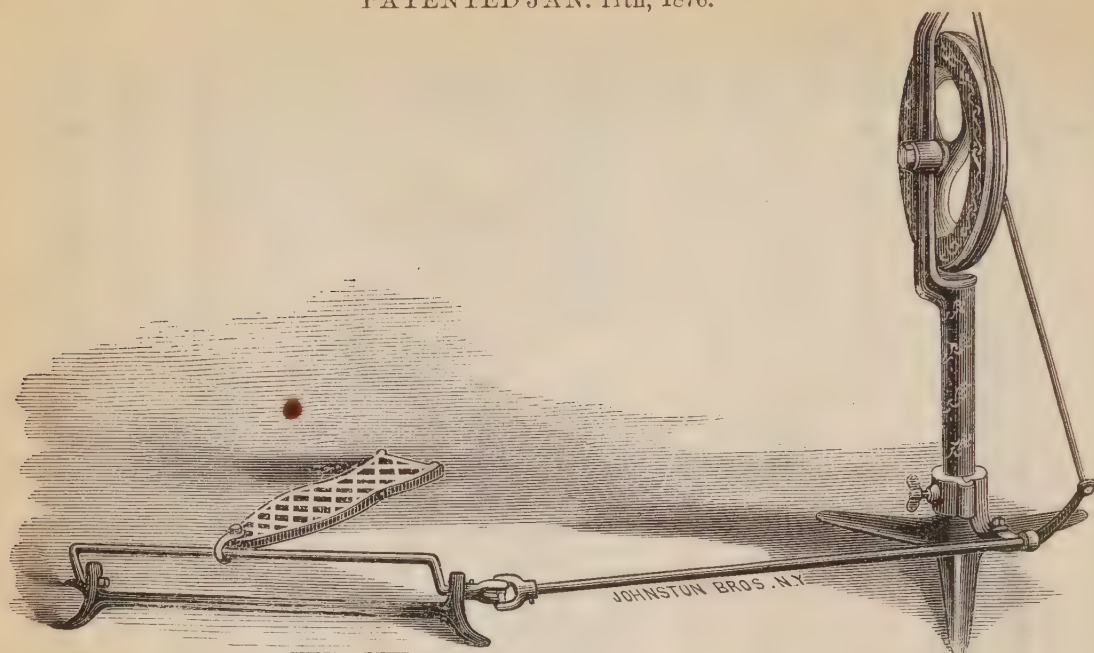
JOHNSTON BROS.,

812 Broadway, N. Y.



STEVENS' EXTENSION TREADLE.

PATENTED JAN. 11th, 1876.



This can be fastened to any of the Dental Engines in use.

This has been designed to accommodate parties who have written us desiring to locate their Engine on the side of their chair, opposite to the position taken by them when operating. We think Dr. Stevens has devised the most perfect Extension Treadle which has yet been proposed.

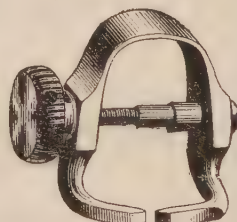
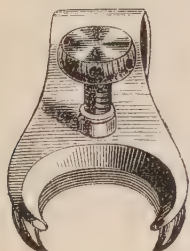
In ordering, please state what Engine it is to be used with.

PRICE..... \$7.50.

JOHNSTON BROS., 812 Broadway, N. Y.

Jarvis' Separators.

(PATENTED SEPT. 8, 1874.)



PRICE REDUCED.

The cuts above shown are full size, and represent an apparatus for separating teeth. It is almost impossible to overstate the value and convenience of the devices. By their use, without delay to the operator or appreciable pain to the patient, adjacent teeth may be forced apart for any of the various purposes for which it has been customary to wedge teeth. Crowded teeth can be readily parted by using the separators, so that rubber dam can be applied without difficulty or loss of time. Two forms are shown by the cuts; of the first form we make three sizes, **No. 1, No. 2, and No. 3.**

The Separator consists of a piece of steel, nickel-plated, bent upon itself, having the two ends formed to fit the outer portions of the proximate surfaces of two adjoining crowns.

These jaws are forced apart by the action of a screw, which passes through one and against the other of them. This form is applicable to all the bicuspids and molars. It does not touch the gums or injure the teeth, neither does it cause pain sufficient to be of consequence.

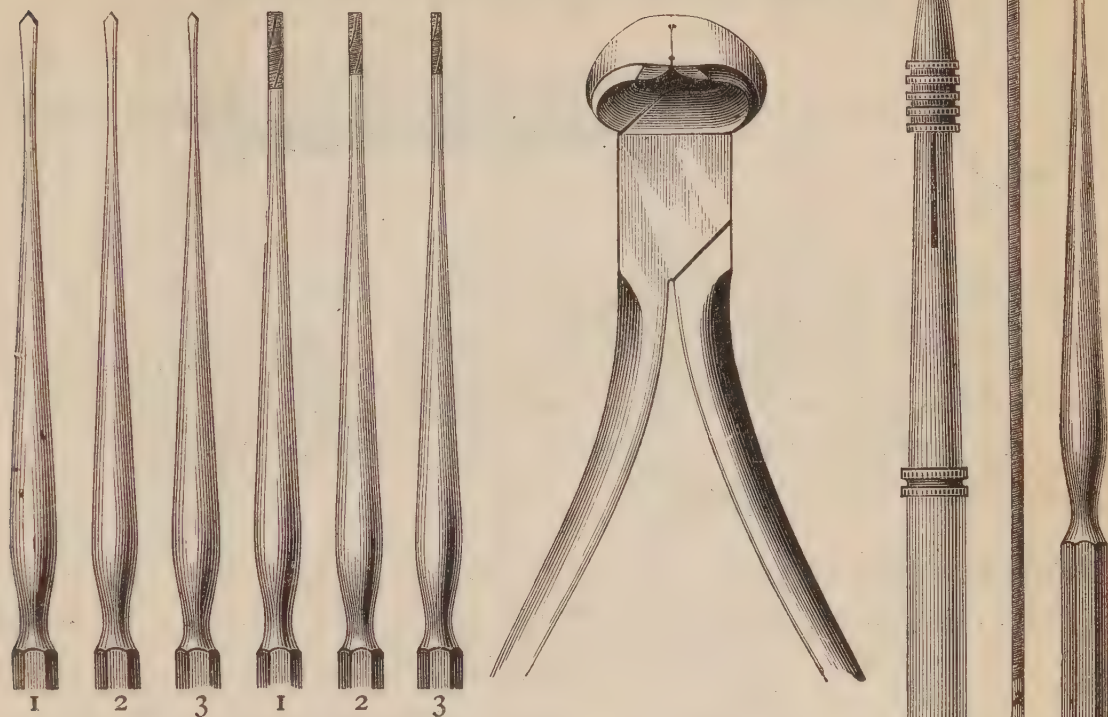
The Compound Wedge, **No. 4**, consists of two wedges approaching or passing each other. This is especially applicable to the incisor teeth, and will be found particularly useful in making room for passing rubber dam around crowded teeth. In use, a small strip of wood should be placed over the teeth and beneath the cross-bar, to prevent the points from sliding towards the gum.

PRICES.

Complete Set of Four.....	\$4.00
No. 4.....	2.00
Nos. 1, 2 or 3, singly.....	1.00

JOHNSTON BROS., 812 Broadway, N. Y.

Morrison's System of Retaining Screws.



Dr. W. N. Morrison, of St. Louis, has furnished us models of his drill-taps and adjustable wire-holder, and gold wire, from which we have reproduced similar instruments or apparatus for the profession.

No especial description is needed in view of the thorough work of our artist. It may be well to call attention to the following facts: The drill-taps and wire fitted for each other bear corresponding numbers, as, 1, 2, 3.

The adjustable wire-holder takes either size of wire.

The cutting plyers are provided with two round openings in their cutting face. The long wire to be used if put in one of the openings can be "nicked" at the proper distance to form the screw while in the wire-holder, so that after having been screwed into place it may readily be broken off, without the use of file or plyers in the mouth.

In the above numbers of Drills, Taps or wire:

No. 1 corresponds to Mack's No. 0.

No. 2 " " No. 3.

No. 3 " " No. 1.

We make no number corresponding to No. 2 of Mack's system, it being very nearly the same size as No. — of Morrison's system.

PRICES.

Complete Set, including three wires, 3 inches long:

Wire-holder, nickel-plated.....\$1.50.

Drills, each.....50 cts.

Taps, ".....50 cts.

Nippers, nickel-plated.....\$2.00.

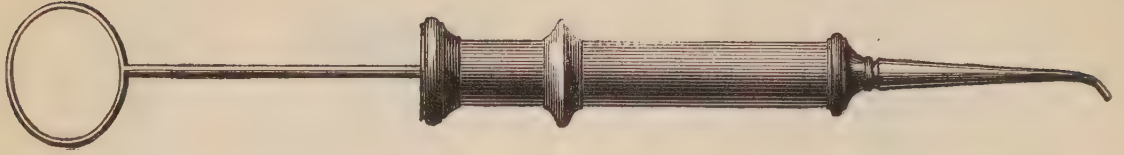
No. 1. No. 2. No. 3.

Gold rods, each....\$1.50....\$1.20....\$1.00.

JOHNSTON BROS.,

812 Broadway, N. Y.

SYRINGE.



This syringe, of metal, nickel-plated, is represented half-size. It is provided with a spring, a suggestion from Dr. A. H. Brockway, so that if after use it is placed in water its piston rises and it fills itself with water, and is so constantly ready for use.

The points, straight and curved, are removable at will.

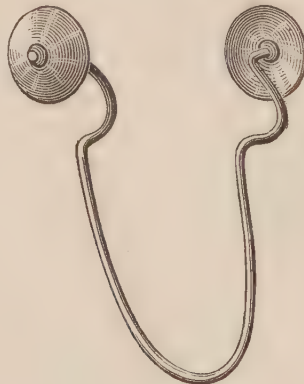
PRICES.

With one point, curved.....	\$2 25
With two points, one straight and one curved.	2 50

JOHNSTON BROTHERS,

812 Broadway, New York.

Elliott's Cheek Distender.



Cut is $\frac{1}{4}$ size.

This convenient device, as its name implies, is designed to distend the cheeks of a patient during operations on the teeth.

Its bow of spring wire, and the cheek pieces are polished and nickel plated. It serves, in connection with its principal use, to reflect light on the teeth. As the spring is not stiff it is worn with very slight inconvenience. *This is proving extremely popular.* Price \$1.00.

JOHNSTON BROS.,

812 Broadway, N. Y.

FRENCH ROOT FORCEPS.

Patented Dec. 2, 1873.

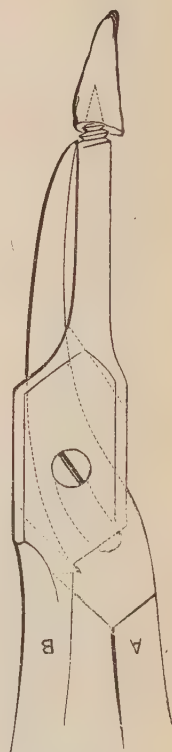


Fig. 1.



Fig. 2.

JOHNSTON BROS. N.Y.

These Forceps, the invention of Dr. C. G. French, are designed to do the work of the Hullihen Forceps, and will be found much simpler and more effective instruments. As shown in Fig. 1, the jaw opposite the screw is drawn back so that the screw may be readily inserted in the root. The jaw when withdrawn is prevented from sliding forward by the catch between the handles shown in each outline cut. After the jaw is firmly seated in the root, it is only necessary to disengage the catch, and see that the free jaw bears squarely on either the labial or lingual surface of the root (choose the stronger), when by simply closing the handle, the free jaw is forced by the cam action of the joint down into the socket, thus bringing it opposite the screw, when of course the root may be readily withdrawn. It will be seen that with these forceps it is not necessary to lacerate the gums or crush through the alveola, as the sharp point of the jaw is forced forward *along the side* of the root by the action of the joint, cutting the root clear on that side, and at the same time loosening it by its wedging action.

PRICE, NICKEL-PLATED, \$3.50.

JOHNSTON BROS., 812 Broadway, N. Y.

FOIL TWEEZERS.

A thoroughly made article. They can be had with straight points as represented above, or with curved points. Prices :

Plain.....\$1 00

Nickel Plated..... 1 50

JOHNSTON BROS.

WOOD STRIPS.

Cotton Wood, per bundle.....20 cents

Box Wood “ “12 “

Orange Wood “ “10 “

JOHNSTON BROS.

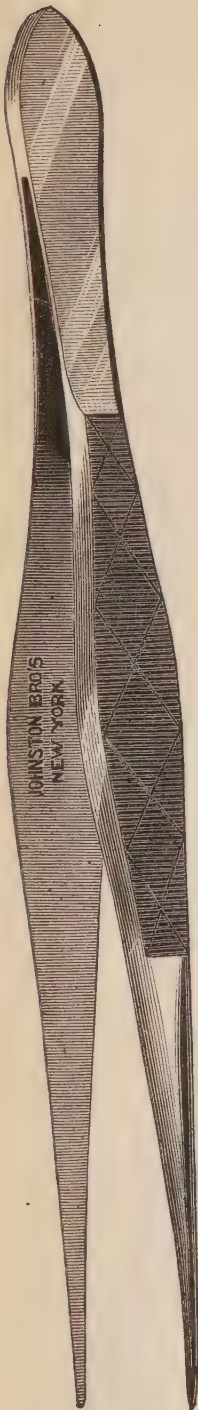
DENTAL PICTURES.

Pictures on Dental subjects are not very numerous, and will always possess interest to practitioners of dentistry. Having reproduced several copies of ancient paintings and engravings, illustrative of dentistry in other countries and in olden time, as frontispieces for the DENTAL MISCELLANY, we have, at the request of friends, also printed them upon plate paper, in suitable form for framing or for preservation in a portfolio.

Those now ready are—

1. Der Zahnarzt—From a Steel Engraving of 1672.
 2. The Tooth Drawer—English.
 3. The Monkey as a Dentist—From a painting by DeCamps, 1840.
 4. Der Zahnbrecker—From a German Plate.
 5. Transplantation—1787. By Rowlandson.
 6. The Ludicrous Operator. By J. Harris, London, 1768.
 7. Primitive Dentistry. Scene in Persia by an eye witness.
 8. Fifth Pair of Nerves—not colored. From Tomes' Dental Anatomy.
- Price each, by mail.....50 cents.

JOHNSTON BROS.,
812 Broadway, N. Y.



JOHNSTON ADJUSTABLE FOUNTAIN SPITTOON.



The defects of the Fountain Spittoons hitherto made are, that it is almost impossible to keep them from leaking, and that they occupy a rigid position close to the left of the chair, and hence prevent the operator from working on that side.

These defects will not be found in this spittoon, which is commended to the favor of Dentists by the following points of merit:

1st. It is readily adjustable to the position of the chair; that is, it can by an easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches to the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient, the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way.

3d. Instead of a wooden case, twelve inches square, is an ornamented metal tube one and a half inches in diameter, which will not warp, occupies very little room.

4th. Movable joints are so arranged that any leakage is impossible, since the waste from the bowl never comes to the joint itself, but is discharged below, in the bottom of the lower half of the socket of the globe, and conveyed into the waste pipes.

5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

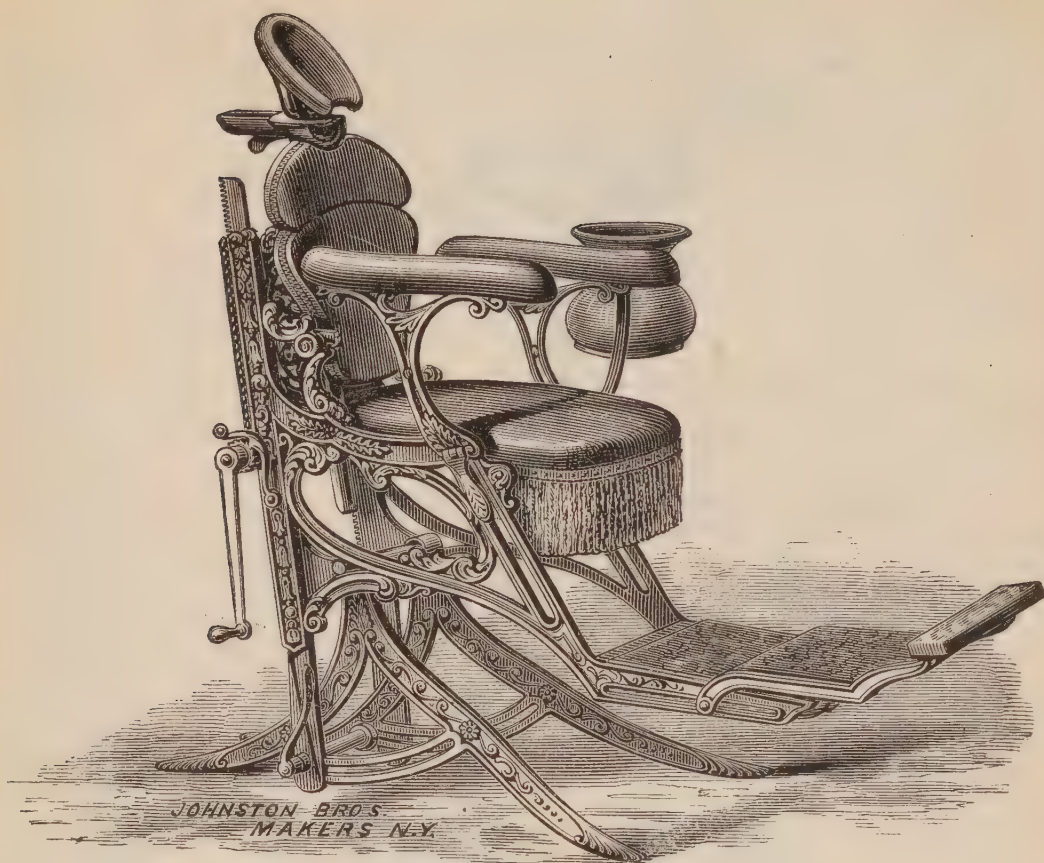
6th. All its bright parts are of gun metal, and its tubing silk covered.

The water jet used is the device of Dr. Redman, of Louisville, Ky.

Price.	\$60.00
Boxing.	2.00

JOHNSTON BROTHERS, 812 Broadway, N. Y.

The Morrison Dental Chair.



Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator :

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient :

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.
It is provided with a comfortable back and head-rest, exactly as is a grown person.
The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.
By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.
2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure for those who may so desire *the rotary movement*, some of these chairs have legs, into which castors are cast. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and as pictured on the chair has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of \$8.00.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

PRICES.

In fine green or garnet plush—with Morrison Head-rest.....\$ 150.00

Boxing..... 5.00

To which price add, if ordered :

With Castors.....10.00

With Johnston Head-rest, instead of Morrison..... 8.00

With extra back-pad..... 4.50

With spittoon attachment and porcelain cuspador..... 8.00

With nickled metallic cuspador and gold trap.....10.00

With Turkish upholstery.....15.00

Real morocco embossed.....10.00

JOHNSTON BROTHERS,

812 BROADWAY, N. Y.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

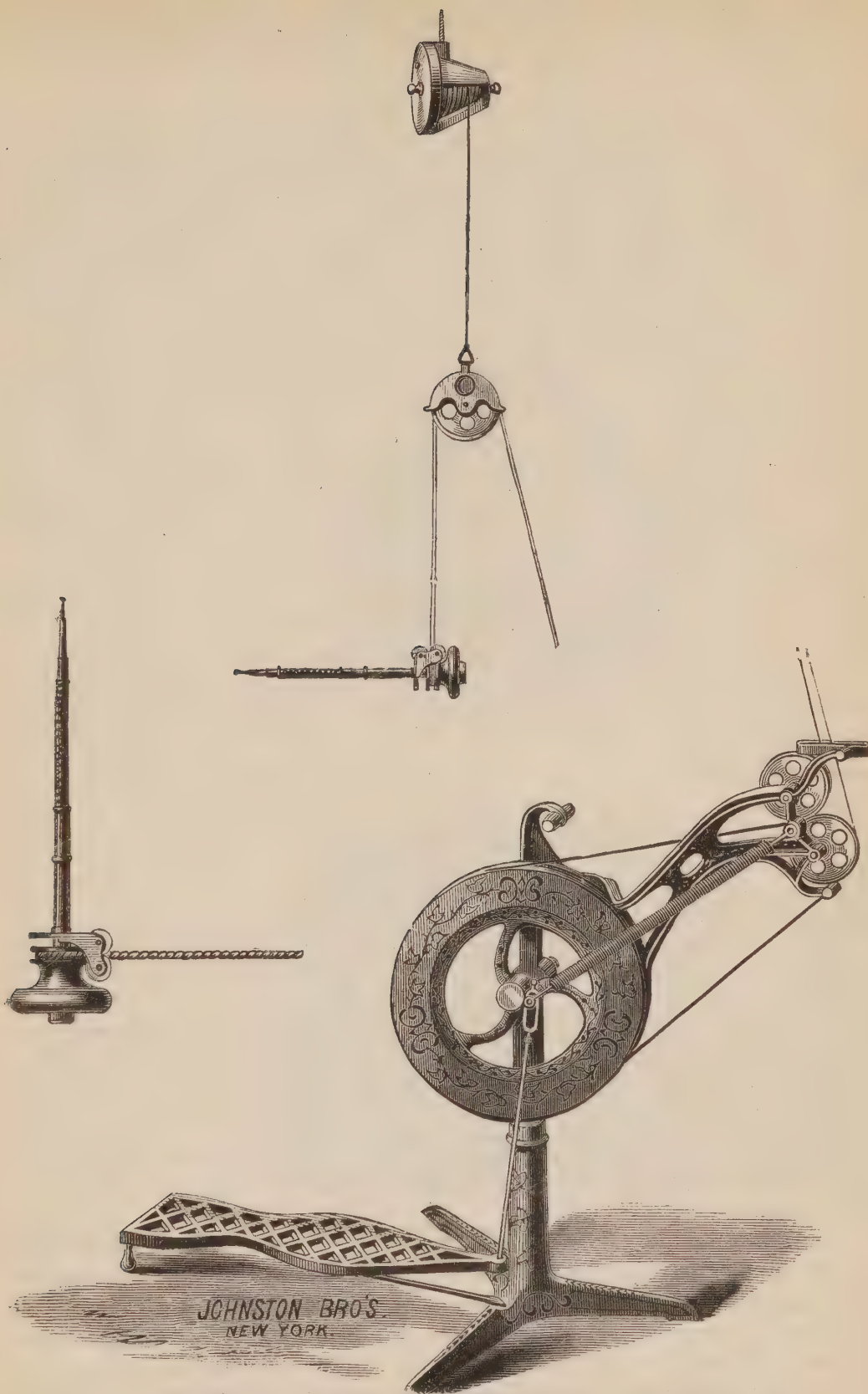
In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or "chattering" which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

- 1st. It is more steady in its movement than any Engine made.
- 2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.
- 3d. It has an abundance of power.
- 4th. It is not easily broken or likely to need repairs.
- 5th. It is, above all others, a "*light running*" Engine.
- 6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROTHERS, 812 Broadway, N. Y



JOHNSTON BROS.
NEW YORK

SUSPENSION DENTAL ENGINE.

(DR. ELLIOTT'S INVENTION.)

Price, \$50.00. Right Angle Attachment, \$5.00. Boxing, \$1.00.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($\text{NO}^2 + 2\text{O} = \text{NO}^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid Nitrous Oxide*, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether.....	I	death to 23,204 administrations.	
Chloroform.....	I	" 2,723	"
Mixed Chloroform and Ether....	I	" 5,588	"
Bi-chloride of Methylene.....	I	" 7,000	"
NITROUS OXIDE.....		no Deaths in 75,000	"

Edward R. Squibb, M.D., than whom our country has no more able pharmacist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

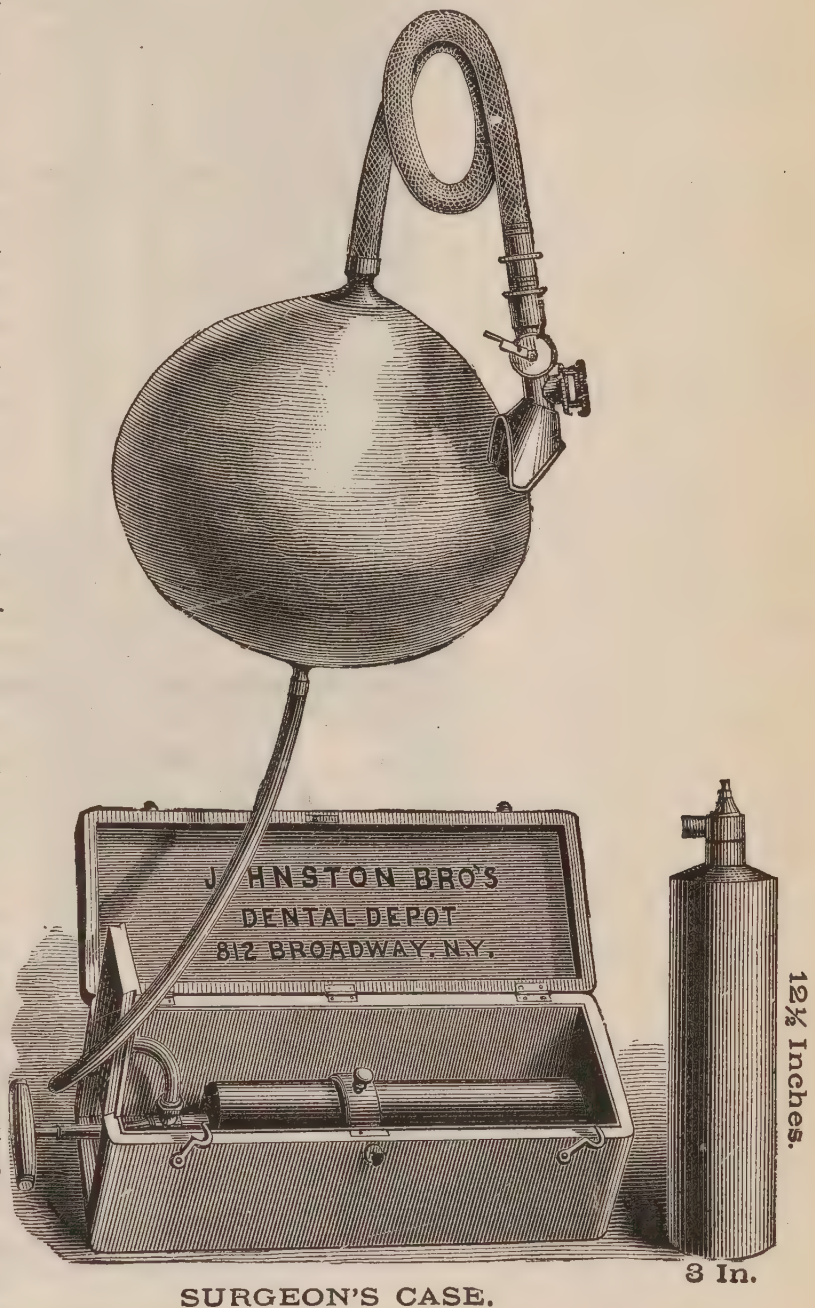
Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

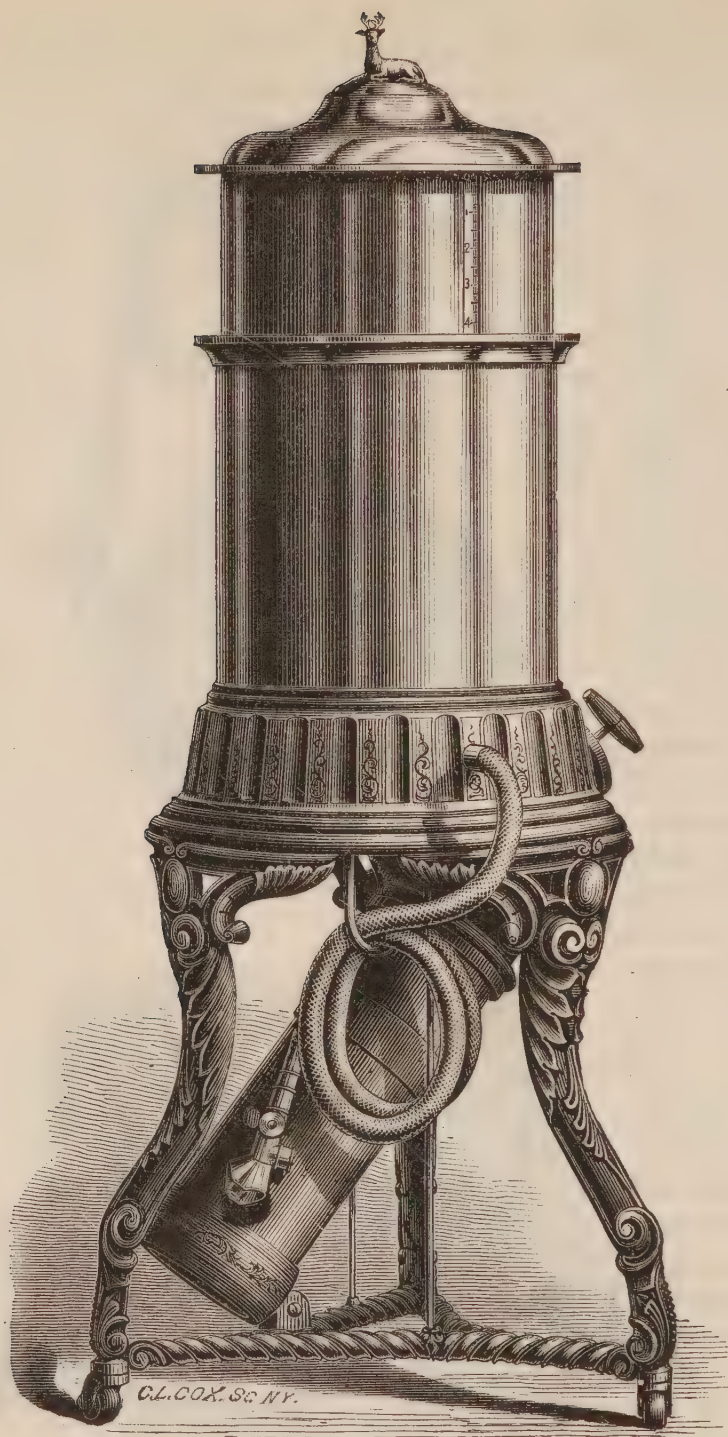
perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers

without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.





NICKEL-PLATED GASOMETER

AND ORNAMENTED STAND

FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas—this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality*.

JOHNSTON BROS., 812 Broadway, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler.....**No. 1**....\$42 00

Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic

Inhaler.....**No. 2**.... 45 00

Boxing either, \$1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas..... 16 00

Refilling Cylinder..... 6 00

Nickel-Plated Gasometer, with ornamented iron stand.....128 00

Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered

Tubing)..... 12 00

1000 Gallon Cylinder..... 36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of $4\frac{1}{2}$ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at $4\frac{1}{2}$ cents..... 45 00

Morocco covered case, with ring and thumb screw, velvet lined..... 12 00

Polished bl'k walnut “ “ “ “ “ “..... 13 00

Of these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity)..... 5 00

Rubber Bag, with covered inhaler tubing, extra size..... 7 00

Inhaler, latest style, with two way stop cock, adapted to the use of both dentists

and surgeons, with connection..... 9 50

Key, Nickel Plated..... 1 50

Wrench, “..... 50

Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag..... 1 50

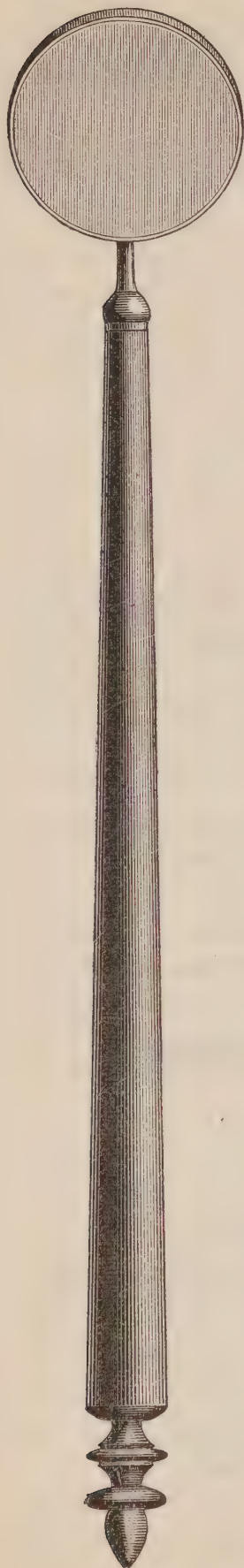
Covered Inhaler Tubing, per foot..... 50

Plated Connection to fit old style Inhaler..... 1 00

JOHNSTON BROS.,

812 Broadway, N. Y.

MOUTH MIRRORS.



Our own make—thoroughly tested. They are first heavily coated with silver, then protected carefully by a deposit of copper, as are the imported glasses known as “the imperishable,” then mounted in a nickel-plated frame.

PRICES.

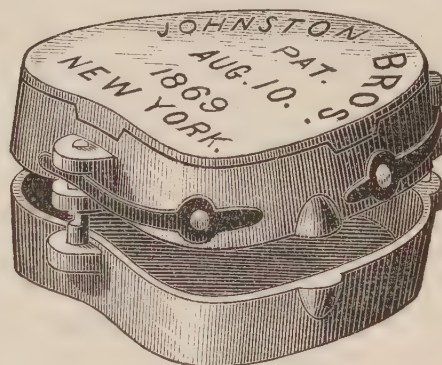
Plain, with ebony handles, $\frac{1}{2}$ to 1 in. diam.	\$1.00
Magnifying, “ “ “ “	2.00
Plain, with ivory “ “ “ “	2.50
Magnifying, “ “ “ “	3.00

JOHNSTON BROS.,

812 Broadway, N. Y.

SELF-LOCKING FLASK.

(PATENTED.)



This flask has been long tested with celluloid in actual use. It may also prove useful in rubber work, in which case it should be closed before being put into the vulcanizer.

POINTS OF MERIT:

1st. By its use one obviates the necessity of waiting to cool his heater before proceeding with a second case, since, when the flask is once closed, it locks itself, the screw may be loosened up, and the case and cam be immediately removed from the heater.

2nd. The click made by the spring as it drops into its socket announces that the flask is closed and the piece cured.

3d. This feature secures the dentist against the carelessness of an assistant, as should the flask fail to close, the fact could not escape his attention.

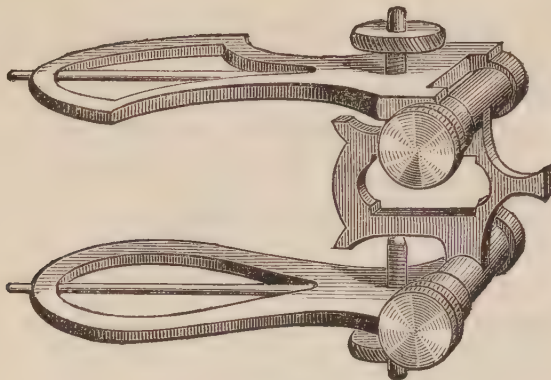
PRICE.

Brass\$2.50

JOHNSTON BROS.,

812 Broadway, N. Y.

ELLIOTT ARTICULATOR.



Price \$3.00.

Points of Merit in the Elliott Articulator:

BY W. S. ELLIOTT, D.D.S., M.D.S

1st. Mechanical simplicity.

2nd. Impossibility of disarrangement of *bite*.

3d. Easy adaptation to all cases.

To use it observe the following DIRECTIONS: Next after the bite has been taken, turn the jaws of the Articulator each upon the other, forward or backward, according as you have a close or wide articulation, at the same time turn the set screws back so that they will be entirely free, when it will be observed that either jaw can be thrown *endwise*, forward or backward at pleasure. Set the cast upon either jaw and adjust the other to the most desirable position. Secure with a very little plaster; when *set* turn down the screws until they touch the inner frame. The entire arrangement is now firm and immovable, except the *open and shut*.

Trim the plaster closely and neatly to the jaws. If it is desired to remove the model, seize the projecting end of the central steel wire, withdraw it, when the model can be removed with ease.

JOHNSTON BROS.,

812 Broadway, N. Y.

ENGLISH PINK RUBBER.

We offer 1 x <i>pink</i>	\$8.00 per lb.
I	8.00 "
White.....	6.50 "
Black.. ..	3.50 "

JOHNSTON BROS., 812 Broadway, N. Y.

FLOSS SILK.

We offer a fresh lot of unsurpassed quality as regards strength, uniformity and fineness of fibre. Each spool contains twelve yards.

Price per spool.....	.15
Price per dozen.....	.\$1.50

JOHNSTON BROS, 812 Broadway, N. Y.

NEW YORK COLLEGE OF DENTISTRY,

1876-77.

FACULTY.

- FANEUIL D. WEISSE, M.D., Professor of Regional Anatomy and General Pathology.
FRANK ABBOTT, M.D., Professor of Operative Dentistry and Oral Surgery.
ALEX. W. STEIN, M.D., Professor of Histology, Visceral Anatomy and Physiology.
F. LeROY SATTERLEE, M.D., Ph.D., Professor of Chemistry, Materia Medica and Therapeutics.
C. A. MARVIN, D.D.S., Professor of Mechanical Dentistry.
WILLIAM H. ALLEN, Clinical Professor of Operative Dentistry.
JOHN ALLEN, D.D.S., Clinical Professor of Mechanical Dentistry.
JOHN T. METCALF, Clinical Professor of Operative Dentistry.
WM. T. LAROCHE, D.D.S., Clinical Professor of Operative Dentistry.
WM. B. HURD, D.D.S., Clinical Professor of Operative Dentistry.
J. BOND LITTIG, D.D.S., Clinical Professor of Mechanical Dentistry.
D. W. WILLIAMSON, D.D.S., Demonstrator of Operative Dentistry.
A. RUST CUYLER, D.D.S., Demonstrator of Mechanical Dentistry.
C. P. KREIZER, M.D., Assistant to the Professor of Chemistry, Materia Medica and Therapeutics.

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Monday, October 4th, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures,)	
Matriculation, Demonstrators', Diploma Fees, and practice in the)	\$150.00
Infirmary the seven and one-half months between the sessions...	
For the Course of Lectures only.....	100.00
Matriculation	5.00
Graduation Fees.....	30.00
Board may be obtained for from \$6 to \$8 per week.	

For further information, address

FRANK ABBOTT, M.D., Dean,
12 West Nineteenth Street, New Yor.

HARVARD UNIVERSITY.


Dental Department.

BOSTON, MASS. 1875-76.

FACULTY.

CHARLES WILLIAM ELIOT, L.L.D., *President*.
OLIVER W. HOLMES, M.D., Professor of Anatomy.
HENRY J. BIGELOW, M.D., Professor of Surgery and Clinical Surgery.
THOMAS H. CHANDLER, D.M.D., Professor of Mechanical Dentistry.
GEORGE T. MOFFATT, M.D., D.M.D., Professor of Operative Dentistry.
LUTHER D. SHEPARD, D.D.S., Adjunct Professor of Operative Dentistry.
NATHANIEL W. HAWES, Assistant Professor of Operative Dentistry.
EDWARD S. WOOD, M.D., Assistant Professor of Chemistry.
HENRY P. BOWDITCH, M.D., Assistant Professor of Physiology.
WILLIAM H. ROLLINS, D.M.D., Instructor in Dental Pathology.
CHARLES A. BRACKETT, D.M.D., Instructor in Dental Therapeutics.
IRA A. SALMON, D.D.S., University Lecturer on Operative Dentistry.
CHARLES B. PORTER, M.D., Demonstrator of Practical Anatomy.
CHARLES WILSON, D.M.D., Demonstrator in Charge.
GEORGE F. GRANT, D.M.D., Demonstrator of Mechanical Dentistry.

The Winter Session of the Eighth year of this School begins on the 30th of September and continues nineteen weeks. The Spring Session begins on Feb. 16th and ends June 29th. Two full Winter Courses are required for graduation. The spring session is simply to take the place of private pupilage, designed chiefly for those who wish to spend their whole three years of study in the school. Unsurpassed facilities for operative and mechanical practice are furnished by the infirmary of the Massachusetts General Hospital which is open throughout the year.

 The University Degree, D.M.D. (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfill the requirements.

F E E S.

Matriculation, \$5.00. Spring Session, \$30.00. Winter Session, \$110.00.
For the Year, \$150.00. Graduation, \$30.00.

From and after September 28, 1876, an entire change will be made in the scheme of Instruction. Instruction will be given by lectures, recitations, clinical teaching and practical exercises, uniformly distributed throughout the academic year, and the distinction of winter and summer sessions will thereafter be abolished.

The course of instruction will be progressive, extending over two years.

The regular examinations will be held in the following order, viz.: At the end of the first year, anatomy, including dissection, physiology and general chemistry. A certificate from the demonstrator of anatomy will be required of each student, that he has satisfactorily dissected the three parts of the body.

At the end of the second year, dental pathology, including a knowledge of gestation and diseases of woman so far as they affect the mouth and throat, dental materia medica and therapeutics, oral surgery and surgical pathology, operative and mechanical dentistry. The examinations in operative and mechanical dentistry will include actual operations and the preparation of specimens of mechanical dentistry.

Every candidate must be twenty-one years of age, and of good moral character; he must give evidence of having studied medicine or dentistry three full years; he must have spent at least one continuous year at this school, have presented a satisfactory thesis and have passed all the required examinations.

FEES UNDER THE NEW PLAN.

There shall be no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee shall be \$200; for the second year, \$150; for any subsequent year, \$50. Students may enter under either the old or the new plan, at their option, in September, 1875, but no degree will be given under the old plan after February, 1877.

For further information address

T. H. CHANDLER, Dean,

222 Tremont Street, Boston, Mass.

PHILADELPHIA DENTAL COLLEGE,

Nos. 108 and 110 N. Tenth Street, above Arch.

FOURTEENTH ANNUAL SESSION, '76-'77.



FACULTY.

J. H. McQUILLEN, M.D., D.D.S., Professor of Physiology.
HARRISON ALLEN, M.D., Professor of Anatomy and Surgery.
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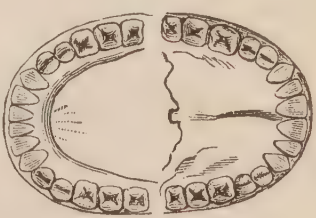
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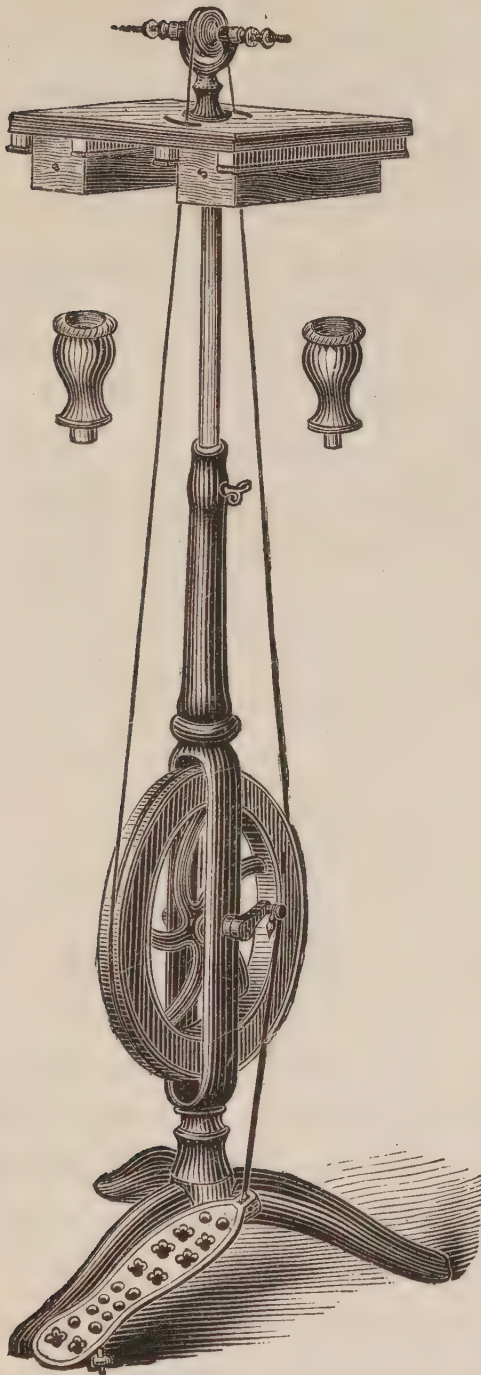
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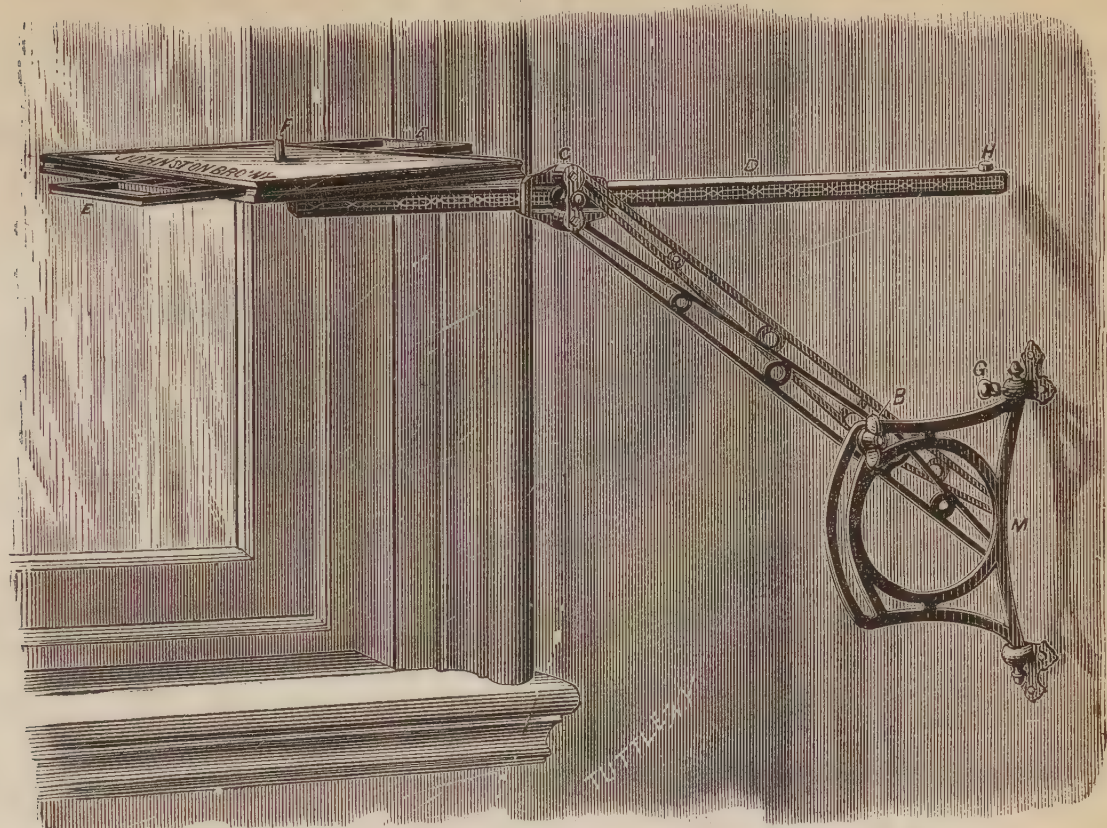
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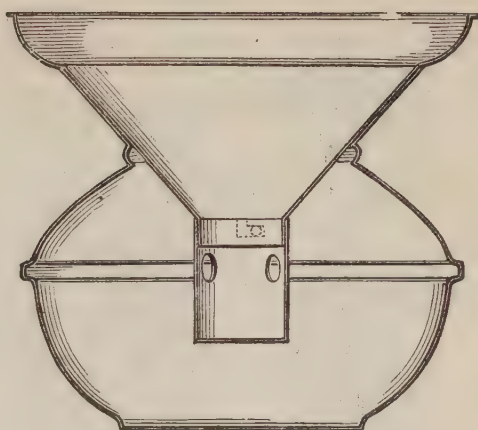
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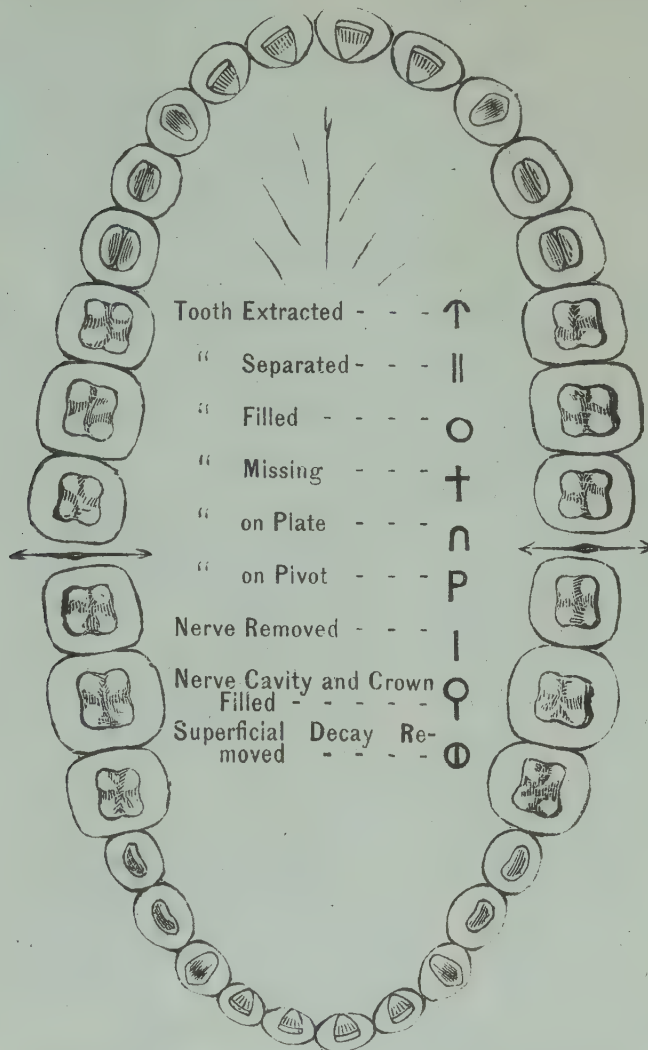
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